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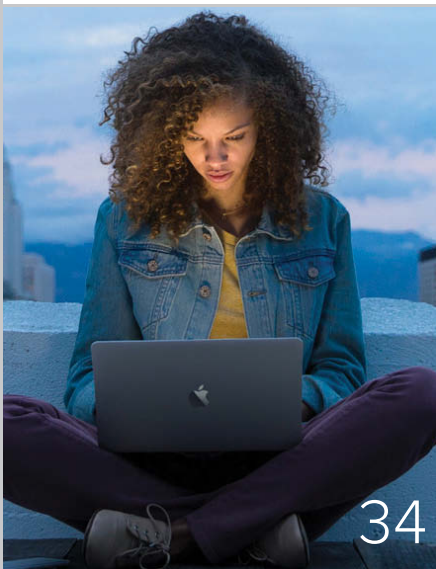
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## Apple TV set to have bigger role

The Apple TV could become the command centre for our homes

Ever since Steve Jobs gave us a sneak peak at Apple's internal iTV project at 2006's 'Showtime' event, we've been waiting for Apple's pioneering set-top box to mature. Officially released just moments before the iPhone, Apple TV was designed to be the magical gadget that bridged the gap between the small screens on our mobile devices and the giant ones in our living rooms, wirelessly delivering our music, movies and photos to a place where they could look and sound their best.

At the time, Jobs declared that the square box "completes the story" that started with the iPod. But we know the story didn't end there. With the dawn of the iPhone, iPad and now Apple Watch, our digital lives have become greater than the things that entertain us. But the box that sits under our TVs hasn't evolved.

Rumours had pegged Apple TV for a long overdue update this year, and the WWDC invitation seemed to suggest that it might come sooner than later. And yet, Apple TV was a no-show at that event. Rumours suggest that Apple wasn't ready to show it off.

For most of us, Apple TV is little more than the 'hobby' Apple has positioned it to be – a fun way to stream media and games without the hassle of wires or extra components – but it could very well be on its way to becoming the command centre for our homes.

### Cracking the code

Walter Isaacson raised the spectre of a flat-screen Apple television four years ago with a tantalising quote from Jobs in his biography, but these days the idea of an Apple TV set falls just below a car on

the feasibility scale. But even if we may never have an Apple symbol embossed on the back of a 50in HD screen, that doesn't mean Jobs' vision of "an integrated television set that is easy to use (and) would be seamlessly synced with all of your devices and with iCloud" won't come to fruition.

Despite the lack of information at WWDC, Tim Cook certainly isn't giving up on it. During Apple's second-quarter conference call, he signalled that the entertainment industry is "on the edge of major, major changes," and while he was coy about his plans, he added, "I think Apple can be a part of that."

Of course, Apple's push for a TV service isn't exactly breaking news. Negotiations have been rumoured for years, and a recent report from the *Wall Street Journal* claims that Apple is

nearing a deal for a TV service in the US, with a couple dozen channels, including ABC, CBS, ESPN, FOX and presumably a few other popular basic cable mainstays such as Food Network and A&E. HBO Now and Dish's Sling TV have already put serious cracks in the foundation, but a significant investment from Apple would be the boost online television needs to break through; and coupled with the on-demand content, Apple's new music subscription service, and the iTunes movies we already stream, such a service would certainly give Apple TV far greater prominence in our living rooms, paving the way for a multitude of advancements.

### Continuous function

Even with different operating systems, our Macs, iPhones, iPads and Watches are more integrated than ever thanks to Apple's Continuity feature in iOS 8 and Yosemite. But the harmony stops with Apple TV. Sure, we can stream games and movies with AirPlay, but for the most part, the sharing experience is far less seamless than it is on iOS and OS X.

For example, if I'm playing a game on my iPhone, I need pause it and turn on AirPlay mirroring if I want to transfer my progress to Apple TV. Or if I'm watching an episode of *Game of Thrones* on Sky Atlantic, I need to pause it, open the app on my iPhone and find it in my Watchlist. And if I rent a movie on my Apple TV, I can't transfer it at all.

But the next generation of Apple TV has the potential to be the ultimate Handoff device – an always-on box that lets you seamlessly transfer media to your TV, with little more than a tap of the remote on your Watch. And it could extend to more traditional DVR functions, too. A killer feature would be the ability to record or save live shows and sports directly to our iCloud drives for easy watching and rewatching wherever we are, via Remote or some kind of a dedicated Apple TV app on our Macs and iOS devices

Apple TV's interface is already simpler than the ones we get on other set-top boxes, but an instant way to access media, apps, games and even productivity tools would up the ante

considerably, transforming the Apple TV into the digital hub it was meant to be, and letting us keep our iPhones docked until we're ready to leave, much like Apple Watch keeps us from reaching into our pockets all day.

### Home sweet HomeKit

The Internet of Things has overtaken our homes, but while the gizmos and gadgets we use to lock and light our homes all offer some degree of intelligence over the 'dumb' versions they replaced, most of them provide very disparate methods of control, mostly via separate iPhone apps. And while HomeKit integration was one of the marquis frameworks unveiled at WWDC 2014, over a year later we've yet to see much in the way of any real advancements that utilise the technology. Apple didn't even mention it at WWDC 2015.

The biggest advantage HomeKit offers over the piecemeal system is universal voice control – such as telling Siri on your iPhone to turn off the lights downstairs when you're too tired to get out of bed – but there are signs that Apple TV could be an integral part of the HomeKit experience. Apple added HomeKit support for Apple TV support in iOS 8.1, but has thus far been quiet on what role the diminutive box will play, saying only that it works as a sort of liaison when remotely controlling devices with Siri.

But HomeKit's promise of integration gives us the ability to create virtual bridges between devices, letting you control groups of gadgets in an instant. As our homes grow smarter, Apple TV could act as a hub to control the various zones we set up, letting us easily create and rearrange gadget groups and allowing for faster and tighter integration between them.

We could tell it to dim the lights when we start watching a movie, or set a 'romantic dinner' mode that tunes Apple Music to a soft rock playlist and flips the 'Do not Disturb' toggle. Or it could start preheating the oven based on the recipe you're preparing. With Apple TV at the centre of our home, the connected things we put in it could get more useful,

as they form a single, seamless chain of automation that understands our routines and adapts to them.

### Call and response

No matter how Apple TV ultimately fits into the HomeKit system, it's a safe bet that Siri will be built into the next revision, bringing long-awaited features such as dictation for searching and voice-controlled channel surfing. But streamlining navigation is likely only part of what Apple's ever-expanding digital assistant will be capable of on Apple TV.

Siri may have started as a cool way to check the weather, but over the years it's blossomed into an indispensable part of iOS, an omnipresent companion always ready to lend a hand or provide an answer. But it's really only useful when an iPhone or iPad is within arm's reach; even iOS 8's 'Hey Siri' feature only works if your iPhone is plugged in close enough to hear your command.

But Apple TV could transform Siri from a bit player into a star. Apple could put Siri at the centre of our lives like never before. We could ask questions, change channels, turn on lights and play songs just by speaking, no matter how far away our iPhone is.

And with a closer relationship with iOS and OS X, Apple TV could be finally become the missing piece that Jobs introduced it as all those years ago. It's probably unrealistic to think that it'll gain a remote camera for FaceTime calls, but a refined notification system could alert us to phone calls and messages while we're watching TV, or suggest tuning to the end of a close football match.

And, of course, the opening of a dedicated App Store will expand the capabilities of Apple TV beyond anything it can do now. Just like they have with the iPhone and Apple Watch, developers will tap into the uniqueness of Apple TV to deliver apps that integrate with what we know but offer an experience tailored for a whole new platform. Apple TV is on the verge of an overhaul of such substantial proportions, it could very well transform the largest screen in our homes into the most important one. Even if it happens to be made by Samsung.





## Apple to pay artists for free Music trial

Taylor Swift convinces Apple to switch gears on music streaming

BY CAITLIN MCGARRY

If there was ever any doubt about how powerful Taylor Swift is, let this be a lesson. Hours after Swift admonished Apple for not paying royalties to artists during Apple Music's free three-month trial, the company abruptly switched gears. "We don't ask you for free iPhones," Swift wrote in a blog post. "Please don't ask us to provide you with our music for no compensation."

Apple media head Eddy Cue took to Twitter after Swift's open letter to the company went viral and announced that the company will pay artists for songs streamed during the free trial.

Swift then tweeted: "I am elated and relieved. Thank you for your words of support today. They listened to us."

Apple pays music rights-holders (typically record labels and song publishers) per stream during the trial, and that rights-holders will then pay out their musicians. The per-stream rate won't be as high during the free trial as it will when Apple Music subscribers start paying £9.99 a month, because Apple is sharing subscription revenues with labels.

Nothing has changed for potential Apple Music subscribers, but record labels and artists who rely on royalty payments to scrape by will be more likely to sign on with the streaming service now they're getting paid.

Indie labels and musicians have been complaining about Apple's policy of

withholding royalty payments during the free trial since Apple Music was announced at the Worldwide Developers Conference in early June. Apple had worked out deals with the major labels that promised them higher-than-standard revenue share – 71.5 percent in the US and around 73 percent overseas – if they agreed to forego royalty payments during the free trial. But smaller labels and indie artists who rely on those royalties to get by were furious over the deal, and Swift stood up to Apple on their behalf.

"Three months is a long time to go unpaid and it is unfair to ask anyone to work for nothing," Swift wrote. "I say this with love, reverence and admiration for everything else Apple has done. I hope that soon I can join them in the progression towards a streaming model that seems fair to those who create this music. I think this could be the platform that gets it right."

She used her best-selling album *1989* as leverage and pulled it from Apple Music. It was initially unclear whether Swift would give Apple the okay to stream the album now that the company has reversed course, but we knew that if she did, it would be a big win for Apple – no other streaming service has *1989*.

On 25 June, the singer confirmed on Twitter that the album will indeed be available on Apple Music. "After the events of this week, I've decided to put

*1989* on Apple Music... and happily so," she wrote. "This is the first time it's felt right in my gut to stream my album. Thank you, Apple, for your change of heart. In case you're wondering if this is some exclusive deal like you've seen Apple do with other artists, it's not," she added.

Taylor Swift's open letter may have sealed the deal on the company's royalty payment reversal, but the independent artists and labels who had protested the royalty-free three-month trial also factored into Apple's decision. Now Apple has convinced two major indie hold-outs to sign on with the streaming service.

Beggars Group, which includes four of the largest indie labels in the world, and Merlin, a network that represents some 20,000 indie labels' digital rights, are now reportedly on board with Apple Music, which means acts such as Arcade Fire and Adele will be available to stream.

While Taylor Swift was the most notable star to pull her music from Apple's streaming service, losing the independent music community would have been a bigger hit. The indie labels make more than 35 percent of US music revenue and take home about half Grammy wins each year. These aren't little-known places with unheard of artists that no-one would even want to stream. Swift may have been the publicly vocal Apple Music critic, but without indie support, the service may have never gotten off the ground.

# iOS 9 beta hints at future products

Clues to iPhone 7 features and new iPads have been spotted in iOS 9's code

BY ASHLEIGH ALLSOPP

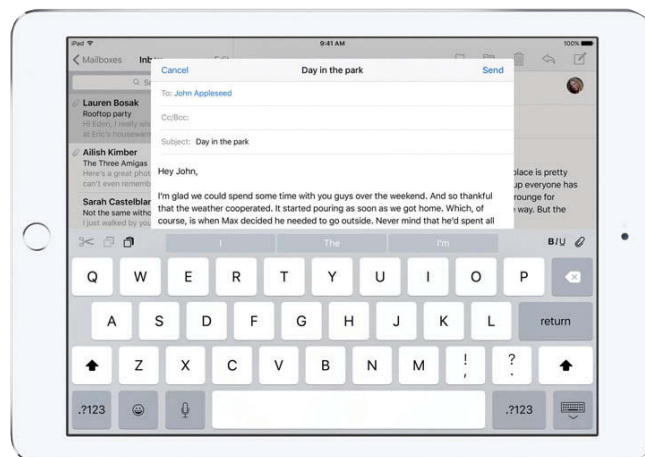
Just after its WWDC 2015 keynote on 8 June, Apple released iOS 9 as a beta, and developers have been exploring the code in the hunt for clues to future products ever since.

One developer, Steve Troughton-Smith, has discovered that the iOS 9 beta code appears to offer a larger iPad keyboard, with several productivity tweaks that would lend itself perfectly to a 12in iPad, dubbed 'iPad Pro' and expected to be a rival to the Microsoft Surface Pro when it launches later this year (or so the rumours say). The bigger keyboard has a shortcut bar, Tap and Caps Lock keys, as well as an entire row dedicated to other characters and punctuation.

In addition, iOS 9's code also appears to support a bigger screen, which is the

exact rumoured resolution of the so-called iPad Pro. The code points to a 2732x2048-pixel display, which would equate to a 264ppi pixel density if Apple uses the rumoured 12.93in display. This should make it easy for developers to scale their apps, as the current iPad line-up has the same pixel density.

As for the iPhone 7, the code seems to suggest that the front-facing camera could get a big spec boost in



future iPhones, capable of capturing 1080p video and 240fps Slo-Mo, and it might even get a flash, taking the selfie trend to the next level.

## Second batch of betas arrive

Apple releases new developer betas of iOS 9, watchOS 2 and OS X El Capitan

BY SUSIE OCHS

Developers got their hands on the betas of OS X El Capitan, iOS 9 and watchOS 2 at the beginning of June at WWDC, but on 23 June Apple released second versions of all three betas.

Those who have signed up to Apple's Developer Program can upgrade the iOS 9 beta over the air or download it from Apple's Developer Resources. The El Capitan beta is available in the Mac App Store, on machines already running the first beta, or from the Mac Developer Center. The second beta of watchOS 2 is available to developers through the Apple Watch app found in the updated iOS 9 beta. Developers will also need to install a watchOS 2 configuration profile found on Apple's website.

These betas bring us one step closer to the public betas set to come along soon, and, of course, nearer to the final versions that will be available later this year. The public beta program for El Capitan and iOS 9 is set to begin in July, and are a fun way to check out the new features before the final versions ship to the world, but also require a lot of updating and could



introduce snags into your workflow. iOS 9, OS X El Capitan and watchOS 2 are scheduled to ship to consumers this autumn, and will be offered as free updates.

# Apple Watch 2 may stand on its own

Wi-Fi chip and FaceTime camera expected for next Apple Watch

BY CAITLIN MCGARRY

If you're waiting for Apple to release the second-generation Apple Watch before you finally buy one, well, we don't blame you. New details indicate that it will be packed with improvements, including a front-facing video camera for FaceTime chats and a wireless chipset that will make the watch capable of standing on its own.

It's the latter that will become a huge selling point for the Apple Watch 2. Right now, your watch requires your iPhone to be nearby for just about everything except activity-tracking and listening to music you've stored locally on the device. But according to a report from 9To5Mac, the tech giant is working to free the Apple Watch from the iPhone for all but the most taxing data transfers and

file syncing by putting a Wi-Fi chipset in the next-generation model. That chip will allow watches connected to Wi-Fi to send messages, check the weather, read email and perform other basic tasks the watch can't handle right now without an iPhone in Bluetooth range. Apple Watch 2 will reportedly make its debut sometime in 2016, so your new watch isn't passé just yet.

According to Slice, a company that offers email receipt tracking to consumers and turns the data into market research, the Apple Watch took a commanding lead in the smartwatch market within two months, with an estimated 2.79 million sales.



By comparison, Samsung shipped 1.2 million smartwatches in 2014, while Pebble reached the one million lifetime sales mark in February after nearly two years on the market.

# Apple quietly dumps iPad mini

Apple removes original, non-Retina iPad mini from its line-up

BY GREG KEIZER

Apple on 19 June quietly stopped selling the original iPad mini, the 7.9in tablet that debuted in 2012.

The smaller sibling to the 9.7in iPad no longer appears on Apple's online store. The iPad mini had been superseded by a pair of follow-ups, including the mini 2 in 2013 and the mini 3 last year. Both of those tablets, while sporting the same-sized screen as the original, boasted

higher resolution Retina displays. Apple initially priced the iPad mini at £319, but as its successors appeared, dropped the price first to £239 in 2013, then £199.

Apple has confirmed the discontinuation of the mini: "The non-Retina iPad mini model is no longer available. Now all models of the iPad mini and Air have 64-bit Apple-designed CPUs and high-resolution Retina displays."

The original mini relied on a 32-bit A5 system-on-a-chip (SoC). Both successors were powered by the A7 SoC, which featured a 64-bit architecture. The larger iPad 2, Apple's current top-of-the-line tablet, runs on a 64-bit A8X SoC. Also still available from Apple: the original iPad Air, which uses a 64-bit A7 SoC.

Most analysts expect Apple will expand the iPad line, with a 12in screen.





# Apple Maps takes on Google Maps

Apple adds public transport information and indoor mapping to Apple Maps

BY OSCAR RAYMUNDO

**T**he WWDC keynote on 8 June included a significant update to Apple's Maps app in iOS 9: public transport directions. Starting this autumn, we'll be able to use Maps to figure out a route to our destination that includes buses, subways, trains, even ferries.

It's been a long time coming, too. Since 2012 – when Google Maps was kicked to the curb in iOS 6 – Apple Maps has had a tab suggesting third-party apps, such as Google Maps, to get public transport routes. The update in iOS 9 marks an important step for Apple and its Maps service not having to rely on third parties to provide such a core smartphone functionality.

You'd think that after all this time Maps would have an expansive network of

public transportation schedules and routes, but this feature is only available in select cities, including London, Berlin, New York, Toronto and Mexico City.

It's not shocking that Apple is taking its sweet time in creating a competitive Maps app. Cupertino is not fond of speed as much of precision. Apple says that Maps will one day be so accurate, it'll tell you which underground entrance is best to take. Apple has started to send out its own fleet of vehicles to collect detailed mapping data, including Street View-style images and 3D mapping. Beyond that, Apple is also testing self-driven robots to collect indoor mapping data of landmarks. The first building that Apple is looking to indoor map is its new spaceship-looking headquarters.



Slow and steady seems to be Apple's strategy, but features such as public transport directions and Street View are firmly in its competitor's rear-view mirror.

## Apple boosts Bluetooth role

The company given permanent seat on the board of directors for the wireless standard

BY BLAIR HANLEY FRANK

**A**pple will be playing a larger role in the development of Bluetooth as the company pushes into wearable technology, home automation, and more.

The Bluetooth Special Interest Group, which oversees the development of the wireless communication standard, announced on 23 June that Apple has become a 'promoter member' of the group, giving the company new power to guide the technology's development. Promoter members are given a continual seat on the group's board of directors, and are also the only membership class that can vote on its corporate matters.

Apple has been an associate board member of the group since 2011, and the company's senior wireless architect,

Joakim Linde, currently serves as the board's secretary. In the past, Apple's board membership was term limited. The current promoter members – Ericsson, Intel, Lenovo, Microsoft, Nokia and Toshiba – voted unanimously to have Apple join their ranks.

The company's upgraded membership makes sense given how important Bluetooth is to so many of its products. The Apple Watch relies on Bluetooth to exchange information with the iPhone it's paired to, and many of the Continuity features introduced to iOS and OS X last year use Bluetooth to exchange data between Apple devices so users can transfer their work back and forth.

Apple first introduced Bluetooth support in Mac OS X at the 2002 Macworld Expo



in Tokyo, along with a Bluetooth adaptor that allowed users to begin testing the wireless communication technology. Starting in 2003, users were able to purchase new Macs with Bluetooth built in. Since then, Bluetooth use has exploded, fuelled by the popularity of mobile devices and wearable tech. Those markets represent one of the tech industry's new frontiers, and the new decision means Apple will have a front seat to help guide the Bluetooth standard. Interestingly, Google isn't one of the interest group's board members, even though it's building technology, such as Android Wear, that also relies on Bluetooth.

# EVERYTHING OS X EL CAPITAN



THE FEATURES WE CAN EXPECT FROM APPLE'S LATEST OS X  
By Karen Haslam

**D**uring its WWDC keynote, Apple previewed OS X 10.11, the latest version of its desktop operating system. Over the following pages, we look at what we can expect from El Capitan.

## Release date and how to get the OS X update now

If you are already convinced that you want to run El Capitan and are wondering just how quickly you can get your hands on it, you'll be glad to hear that you won't be waiting for long.

The operating system will be released in the autumn and you'll be able to download it for free from the Mac App Store. There are, however, a couple of ways to get hold of it before then.

The beta was made available to developers shortly after Apple's keynote finished, and if you've signed up to the Apple Developer Program, you'll be able to download it now. To join the OS X and iOS developer programs, you'll need to

pay \$99 (£64) a year. WatchOS is also included in that fee.

You don't, however, have to be a developer to get your hands on the beta. At the time of writing, a public beta was set to be made available to consumers in July. To sign up for the Apple Beta Software Program, go to [tinyurl.com/pkmbuxz](http://tinyurl.com/pkmbuxz). Click the blue Sign In button and then log in with your Apple ID. Next, accept the Apple Beta Software Program Agreement. Apple will then contact you via email when the software is ready to download.

Before you sign up, you should note that you will be testing pre-release versions of OS X El Capitan, and iOS 9, which is also part of the same program. Running a pre-release version of any software means that you will experience bugs and performance issues, so you might not wish to install El Capitan on your main Mac for fear of losing data, or you might prefer to install it on a secondary partition of the Mac, or on a

separate external hard drive. We recommend that you carry out a full back up before you install the beta.

## System requirements

If your Mac was able to run Mavericks or Yosemite, it will be able to run El Capitan. Those supported Macs include:

- iMac (Mid 2007 or newer)
- MacBook Air (late 2008 or newer)
- MacBook (late 2008 aluminium, or early 2009 or newer)
- Mac mini (early 2009 or newer)
- MacBook Pro (mid/late 2007 or newer)
- Mac Pro (early 2008 or newer)
- Xserve (early 2009)

All of those Macs feature a 64-bit CPU. You'll also need 8GB of space for the install. To find out if your Mac is supported, click on the Apple logo in the top left of your screen and select *About this Mac* → *Overview*. There you will see details of which generation Mac you have.

When Apple announced that El Capitan would have the same system requirements as Yosemite and Mavericks, it confirmed that the next version of OS X would offer improved performance on the older hardware.

**You don't have to be a developer to get your hands on the beta. At the time of writing, a public beta was set to be made available to consumers in July**



## Why call it El Capitan?

Because Apple is building on OS X Yosemite, it felt that the new operating system should take the name of something within the Yosemite National Park. That's why it chose El Capitan.

This follows the convention started with Snow Leopard. When this was introduced, it was the successor to Leopard, with security enhancements and system fixes (sound familiar?)

El Capitan is the name of a rock formation in the Yosemite National Park. Its sheer granite face is said to be one of the world's most challenging for rock climbers. El Capitán means the captain or chief, and was a Spanish translation of the name the Native Americans had given the rocks. Rock climbers and base jumpers refer to the rock as 'El Cap'. We've already started referring to it colloquially as OS Cap Ten. The general consensus seems to be that it's an awkward name, and it generated a lot of banter on Twitter when it was unveiled, with many variants of the name being shared for comedy value. Still it's probably a better name than the other well known rock formation in Yosemite: Half Dome.

## Interface and desktop changes

The name isn't as important as the ways in which the interface is changing in OS X

El Capitan, though. While the changes are minor compared to the complete overhaul that Yosemite received, there are still some notable tweaks.

The first thing you'll notice when you start up El Capitan is that when you wiggle your finger on the trackpad or shake your mouse, as most of us do when we want to locate the cursor, your cursor will jump out at you, so you can see it clearly. It's one way that demonstrates that Apple is taking note of user behaviour when updating the OS.

A significant change to the desktop view that Apple didn't demonstrate during the keynote is the fact that a new option in *System Preferences* → *General* allows users to 'Automatically hide and show the menu bar' in a similar vein to the way that users can choose to hide the Dock. This will be especially beneficial to users of smaller laptops such as the 11in MacBook Air or the 12in MacBook where every pixel counts.

During the WWDC keynote, Apple's Vice President of Software Engineering Craig Federaghi showed off some new (and old) ways of managing your desktop. Currently when you have lots of things open, you can use Mission Control (probably F3 on your Mac keyboard) to view a minimised version of all the documents and apps you have open,

along with any desktop Spaces (where users can gather particular programs). We're pleased to see that the older Exposé behaviour has returned to the Mission Control view – currently in Yosemite when you press F3 you see documents associated with apps all gathered together.

We preferred the way Exposé used to show minimised views of all the documents you had open, so you could see them – rather than having the Word document you were looking for hidden behind another. The old behaviour will return in El Capitan: pressing F3 will reveal all your open apps, making it easy to find the right document amidst the multiple documents you have open.

In addition, a new Spaces Bar will make it easier to create and manage multiple desktops. A '+' will appear in the far right of the Spaces Bar. Click on it to create a new desktop. Although you can already add new Desktops in Spaces by clicking on the desktop image poking out of the top-right corner, the new method is a lot more intuitive and the new design takes up a lot less space.

El Capitan will also introduce better options for working with multiple apps at the same time thanks to an improved full-screen mode. Clicking and dragging the green window-resize button will



Split-screen image





Photos

activate a new Split View that fills the screen with two apps at once. Users can choose the amount of space given to each app.

Another change not mentioned during the keynote is the new system font. As anticipated, the San Francisco font found on the Apple Watch will be making its way to OS X (and also iOS 9). The system font in iOS 8 and Mac OS X 10.10 Yosemite is Helvetica Neue. If you are wondering what the new font looks like, it's similar to Helvetica Neue, though the capital R is less rounded. At least that's how we can tell the difference.

## Spotlight

This is gaining some longed for enhancements: namely the ability to move the new Spotlight window around the screen. In Yosemite, this moved from the right-hand side of the screen to take prominence in the centre, which is a problem if it is overlapping applications you are working with. In El Capitan, the Spotlight window can now be dragged away from the screen centre.

Our other wish hasn't been fulfilled (yet) – the Spotlight window still disappears as soon as you click into another application. When using Spotlight

to perform calculations or conversions, it would be useful to be able to see the answer when you are trying to add it to the document you are working on.

Spotlight does gain a few other improvements, though. The most notable is probably the fact that it now lets users write queries in so-called 'natural language'. Search for "documents I wrote last July", for example, and Spotlight will find those documents. This could hint that Siri is coming to the Mac since that is exactly the phraseology that a user would use to ask Siri the same question.

According to Apple, Spotlight also searches more places, including weather, stocks, sports and web video.

## Photos

Apple only recently rolled out Photos for the Mac, a companion app to the iOS version, so we weren't expecting a big change in OS X 10.11. There are, however, new features and enhancements to the editing options, including support for third-party editing tools, which you'll be able to download from the Mac App Store.

When El Capitan arrives, geotagging will return. The ability to tag a location is absent in Photos, but was an option in iPhoto, so has been missed by many.

Users will also be able to sort albums by date, as well as title, and batch-change names. Photos will be better at handling Faces, too. The update isn't yet available in the beta version of El Capitan, so for now, that's all we know.

## Safari

Apple spent some time showing off two new features in Safari: first, the ability to pin your favourite sites; and secondly, the ability to spot audio playing in tabs. These features are both known to Chrome users, so they aren't exactly groundbreaking, but they are welcome.

Pinned sites are like tiny tabs – shortcuts to those sites you visit every day, such as Facebook or YouTube. It struck us that this is yet another way to store our favourite sites – we already have Favourites and Top Sites, which do the same thing.

Audio can be muted with a single click on its tab, which will be welcome to anyone who's had multiple web pages open only to suddenly hear audio blasting out of their Mac. The new version of Safari will make it obvious which of those tabs is responsible and you will be able to hit a mute button on that tab. If you have more than one audio stream open, Safari



will make it easier to manage that, too – click on the speaker icon in the address bar to see a list of all the tabs playing audio. You'll be able to shut down the audio on the tabs you wish from this view.

Not announced during the keynote, the Safari Reader has font options, plus the web browser's top hit will show now when you search in Spotlight.

## Notes

Notes gets a much needed refresh. It's been far too limited to be useful other than as a way to share text between the Mac and iPhone quickly.

Now, it can now handle media including photos and PDFs, URLs and map locations, as well as text. It will sync with other devices on the same account. And it will allow formatting of text. There's a new formatting option that will turn a list into a checklist, and you'll be able to share to Notes from other Mac apps.

There's also a new attachments browser, which you can flick through to find all the media, websites and other attachments you have added to Notes, similar to how you can look at all the images sent to you in Messages.

## Maps

The big news as far as Maps is concerned is that it's gaining public transport directions, so if you aren't walking or driving, you will be able to find your route (presuming you live in London and are using the tube or bus – as yet trains are not included, and the data doesn't go

beyond the M25). You may be thinking that the update to Maps is more likely to make a difference to you when you are out and about with your iPhone, but it appears that the OS X Maps version includes detailed maps of tube stations so that you can plan which exit to use.

## Mail

Apple's Mail app will also gain some new features, many of which are reminiscent of the iOS versions of the app. For example, new gestures include swiping to delete an email, and you can also swipe right to mark as unread. There's also an option to hide windows within an app without minimising them – just click on the inbox to minimise the message you are composing to the bottom of the screen, a bar will indicate its presence. You can click on that bar to open the email again, though you may not need to: you can drag attachments into this minimised window to include them in the email you are composing.

Mail also gains better integration with calendar and contacts – this means that if you receive an email from someone who isn't in your contacts, Mail will offer to add them. If a friend invites you to meet up, it will offer to create a calendar event for you. Other new features include tabbed windows to manage different email threads and natural-language search, so you can look for 'emails from Ashleigh including photographs', for example.

## Apple Metal updates

There is one more significant change coming to El Capitan, Metal, the graphics

technology that was announced with iOS 8. It will bring improved game performance and improved performance in processor hungry apps.

Metal is a core graphics technology that gives apps near-direct access to the GPU. According to Apple, it will make graphics rendering 40 percent more efficient and games drawing performance is 10 times faster. Apple also claims improved battery life because of a 40 percent reduction in the CPU require to do graphics.

The technology combines OpenGL and OpenGL into a single API, bypassing the OpenGL framework. OpenGL runs slowly on OS X, dragging professional Mac apps down in comparison to their Windows counterparts, so bypassing OpenGL and making apps run natively on top of Metal is good news.

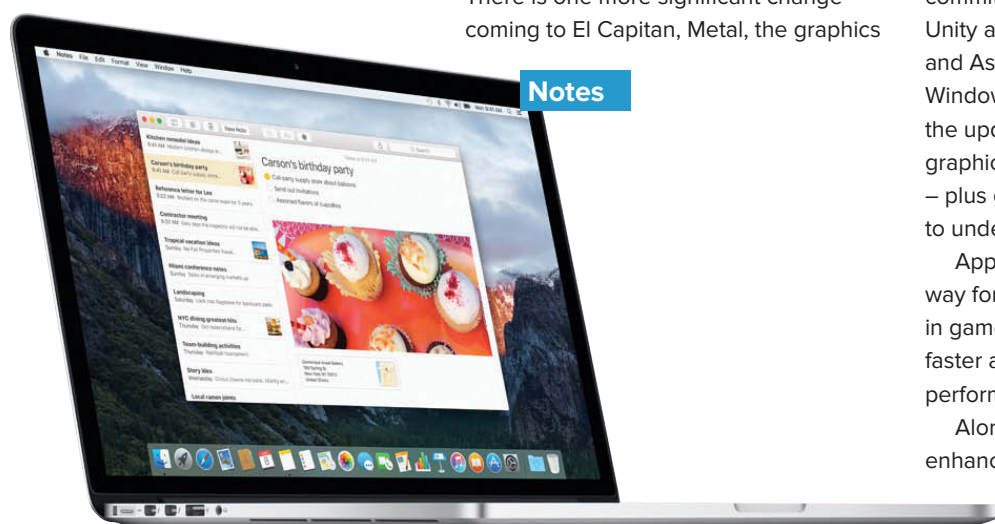
Adobe has already committed to adopting Metal for its OS X apps and demonstrated how it has improved After Effects and Illustrator. During the presentation, Federighi claimed that Adobe has confirmed it is able to deliver an eightfold improvement in rendering in After Effects.

Autodesk and The Foundry have also committed to using Metal and it is believed the technology will also speed up the likes of Autodesk's Maya.

Metal for OS X is also great news if you're a Mac gamer. According to Apple, users can expect performance to be improved tenfold in games. Major developers have already confirmed commitment to the technology, including Unity and Blizzard, as well as Feral and Aspyr, who specialise in bringing Windows games to the Mac. Thanks to the update, users should see accelerated graphics in high performance games – plus games will get direct access to underlying graphics hardware.

Apple says that Metal will pave the way for "new levels of realism and detail in games and other apps". This means faster and more efficient rendering performance across the system.

Along with the performance enhancements coming in El Capitan, we expect Metal to have an impact on processor intensive work.



# THE BEST NEW FEATURES IN OS X EL CAPITAN

EL CAPITAN IS ONLY IN BETA AT THE MOMENT, BUT WE'VE IDENTIFIED 10 NEW FEATURES THAT WE ARE PARTICULARLY EXCITED ABOUT

By Karen Haslam

**W**ith OS X El Capitan, Apple is focusing on performance and introducing only a handful of new features. However, that doesn't mean there are no new features for Mac

users to enjoy. There will be tweaks to the interface, new full-screen views, changes to the way you arrange all the windows on your desktop, a smarter Spotlight, and changes to the Safari, Notes and Photos apps.



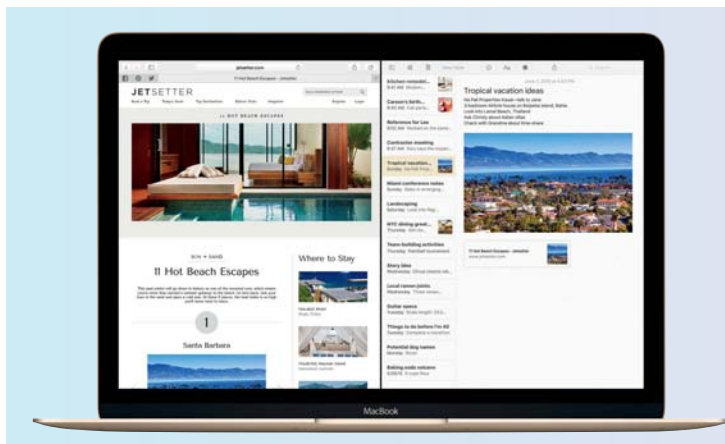
## Cursor locator

Our favourite new feature might just be the new way to find your cursor – just shake your mouse, or wiggle your finger on the trackpad, as we all do, but doing so will now make the cursor grow in size momentarily.



## Split View in full-screen mode

An improved full-screen mode lets you have more than one app open at once. Clicking and dragging the green window-resize button activates a new Split View that fills the screen with two apps at once. Users can choose the amount of space given to each app.

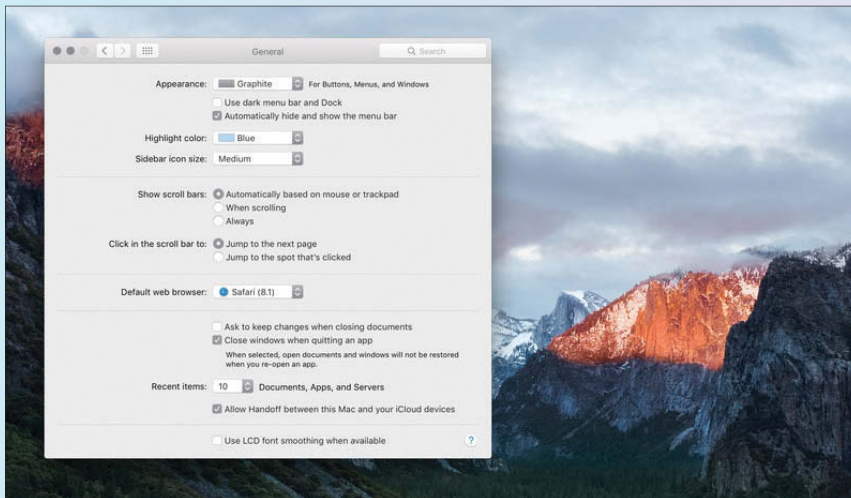
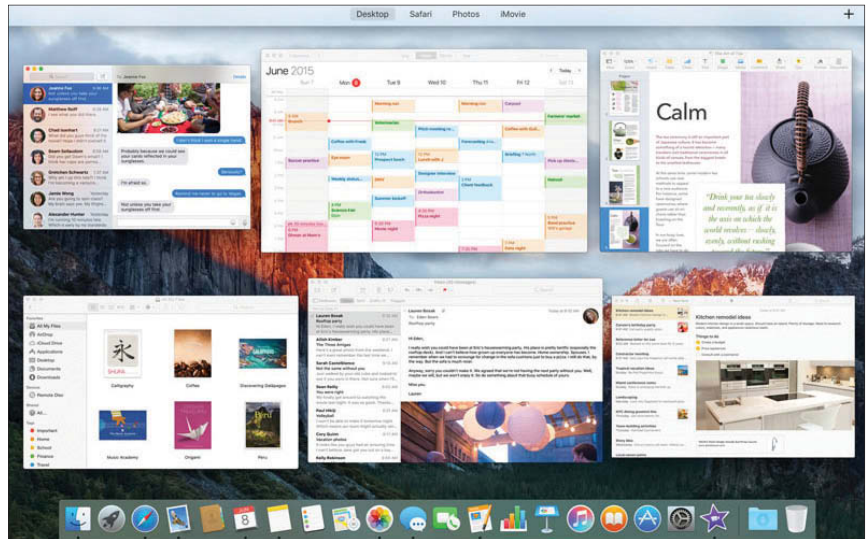






## El Capitan Exposé

The older Exposé behaviour has returned to the Mission Control view – currently when you press F3 documents associated with apps are gathered together, overlapping each other. In El Capitan you will see minimised views off all the documents you had open so you can see and select the one you want.

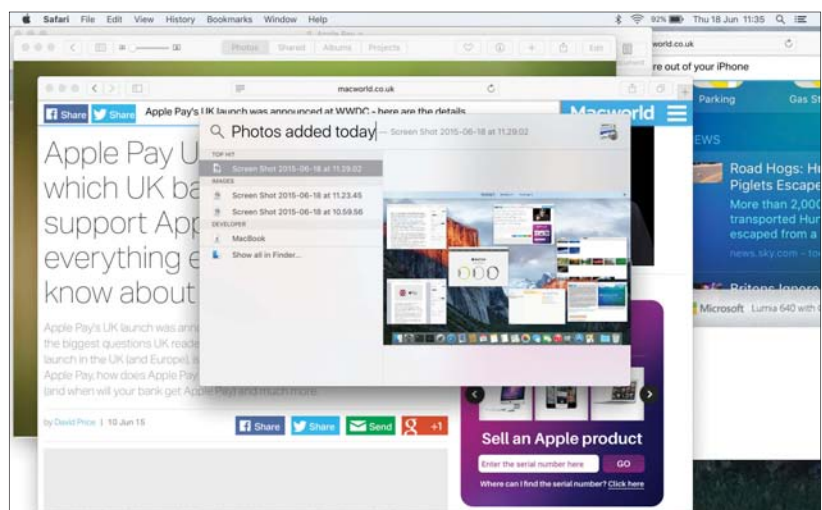


## Hide the Menu Bar

A new option in *System Preferences* → *General* allows users to ‘Automatically hide and show the menu bar’ in a similar vein to the way that users can choose to hide the Dock.

## Natural language Spotlight

Spotlight is also getting natural language search. You’ll be able to construct your search query in a more colloquial way. For example: “documents I wrote in July” or “photos added today”.



## Moving the Spotlight window

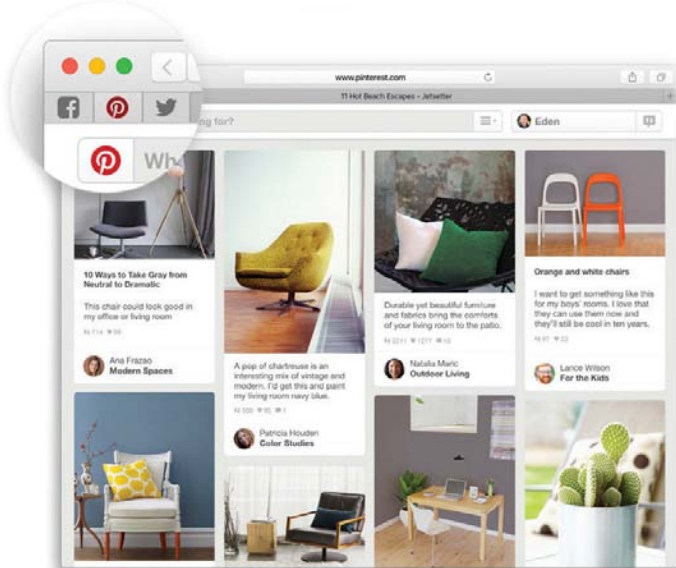
One of the biggest frustrations people had in Yosemite was the fact that the Spotlight window was fixed to the middle of the screen.

In El Capitan, you'll be able to click on the Spotlight result box and move it around the screen.



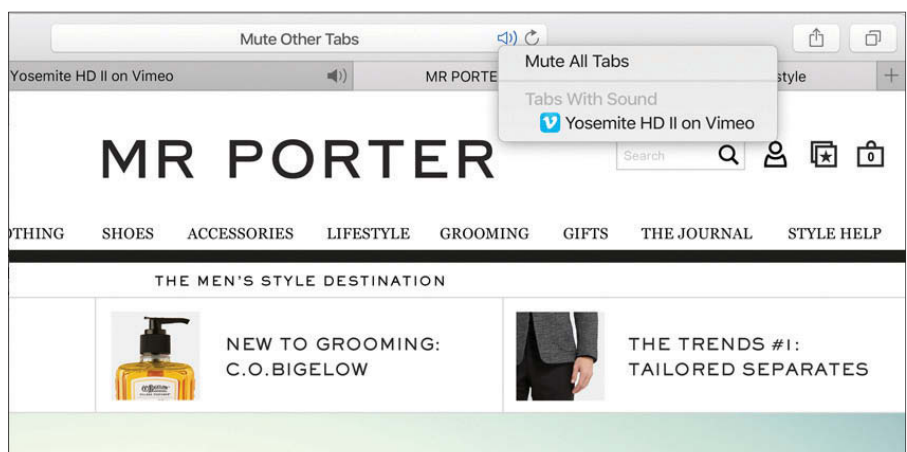
## Pins Tabs in Safari

In Safari, you'll be able to 'Pin' favourite sites to the menu bar – a simple way of adding a shortcut to Facebook or YouTube. Go to *Window → Pin Tab*.



## How to tell which Safari tabs are playing audio

Safari will also identify which of your open tabs is playing audio. It is possible to mute the audio with a single click on that tab click and choose Mute this Tab.





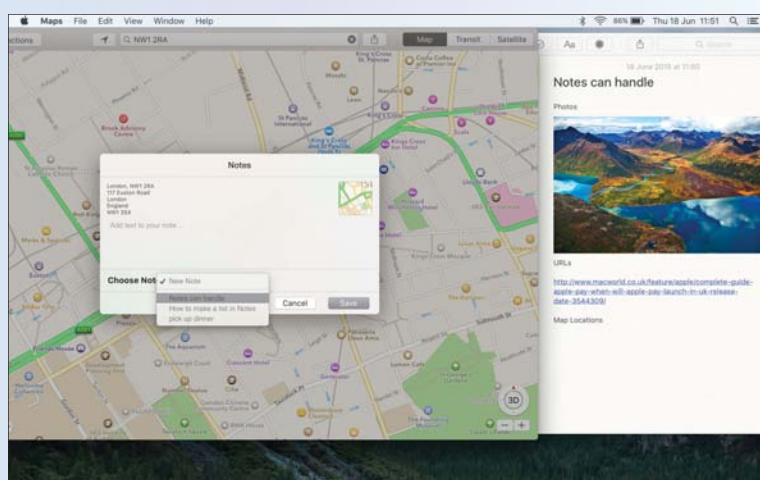
## Swipe to delete in Mail

There are two new gestures in Mail that will be familiar to any iOS users: swiping left to delete an email, and swiping right to mark as unread.

You'll also be able to minimise an email you are composing, just as you can in iOS. And you can open multiple tabs when you are composing emails.

## Add PDFs, URLs, and maps to Notes

Notes will handle photos and PDFs, URLs, and map locations as well as text. To add a map location, click the Share icon and choose Notes. You can then choose to add the Map location to the Note of your choice. Double-click on the location in Notes to load up the map. You'll also be able to format that text, including an option that will turn a list into a checklist.

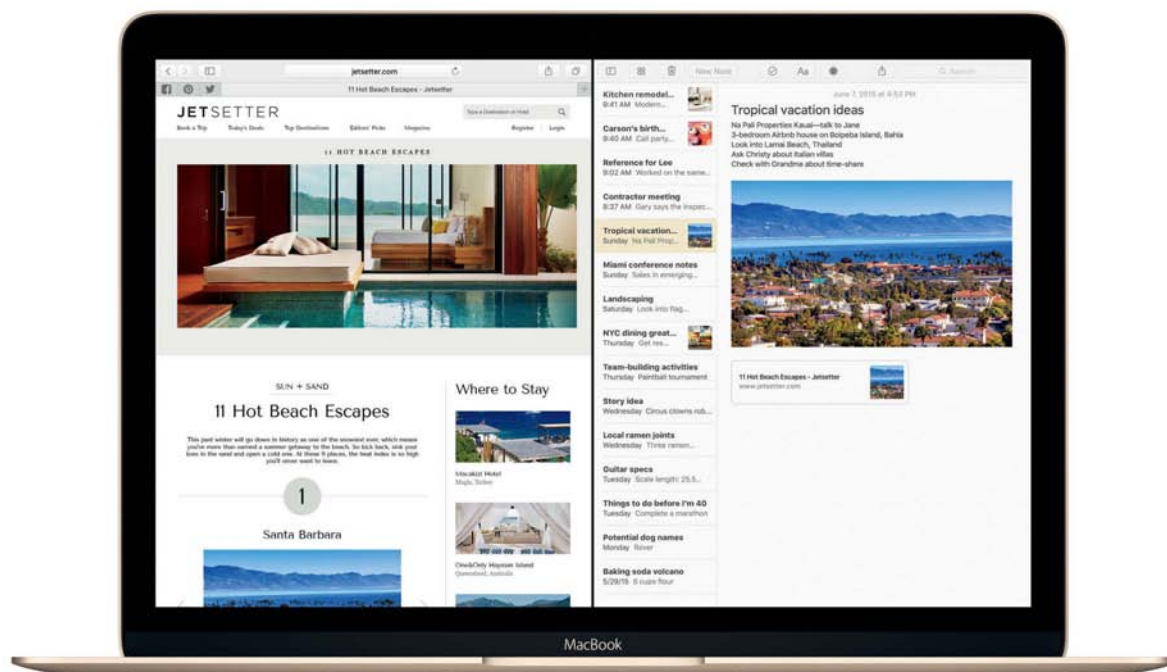


## Viewing attachments in Notes

There's also a new attachments browser in Notes that you can flick through to find all the media, websites and other attachments you have added to the app from any of your devices, click on the icon that represents four small squares.



# HOW TO JOIN EL CAPITAN BETA SEED PROGRAM



IF YOU CAN'T WAIT UNTIL THE AUTUMN TO GET YOUR HANDS ON APPLE'S NEWEST OPERATING SYSTEM WHY NOT JOIN THE BETA SEED PROGRAM?

By Karen Haslam

**A**t WWDC 2015, Apple announced that it was letting the public test the upcoming new version of the Mac operating system – El Capitan – as part of its new, free beta programme.

It will let you download and run beta versions of OS X 10.11 – there will be multiple versions as Apple irons out the bugs and glitches. Those who register can download the software and give feedback to Apple to help it perfect the operating system before it's released to the public in the autumn.

To sign up, go to [tinyurl.com/pkmbuxz](http://tinyurl.com/pkmbuxz) and follow the onscreen instructions. Apple will send you an email informing you when the El Capitan Beta is available to download. Last year, those who had signed up for the beta programme received an email from Apple around 24 July, which included a redemption code for downloading the beta.

Registered Apple Developers are able to download pre-release versions of most of Apple's software too, though this costs \$99 (£64) per year.

## The risks involved

It's worth noting that participating in Apple's OS X Beta Seed Program is not a light undertaking, so you should consider whether it's really right for you before downloading and installing the pre-release software. After all, it's bound to have bugs and issues that could cause things to go spectacularly wrong with your Mac. This isn't helped by the fact that Apple is not obligated to provide any support for pre-release software.

If you have only one Mac, and you're intending to run the pre-release software on that machine, you might want to reconsider. Apple suggests that you run the beta program on a dedicated Mac, and not one that you use for business or personal purposes. There's also the important matter of privacy. By agreeing

By agreeing to test the OS X beta software, you're giving Apple permission to collect diagnostic, technical and usage data from you



to test the OS X beta software, you're giving Apple permission to collect diagnostic, technical and usage data from you, unless you go through the process of opting out.

Last year, the first beta version of OS X 10.10 Yosemite had several known issues. These included problems in Safari while trying to access Netflix content, iPhoto, Photo Stream and iCloud Photo Sharing, as well as issues with iCloud Drive and AirDrop, so beware.

If this hasn't put you off and you're still interested in signing up to the Beta Seed Program, here's what you need to do.

### How to sign up

First, you'll need to go to the OS X Beta Seed Program website. From there, you can find out more about the program by clicking Learn More or FAQ.

You must be aged 18 or older with a valid Apple ID, and you'll also need to be willing to accept the Confidentiality Agreement, which means that you agree not to share information or screenshots of the update. The public beta software is confidential information and Apple doesn't want to share it.

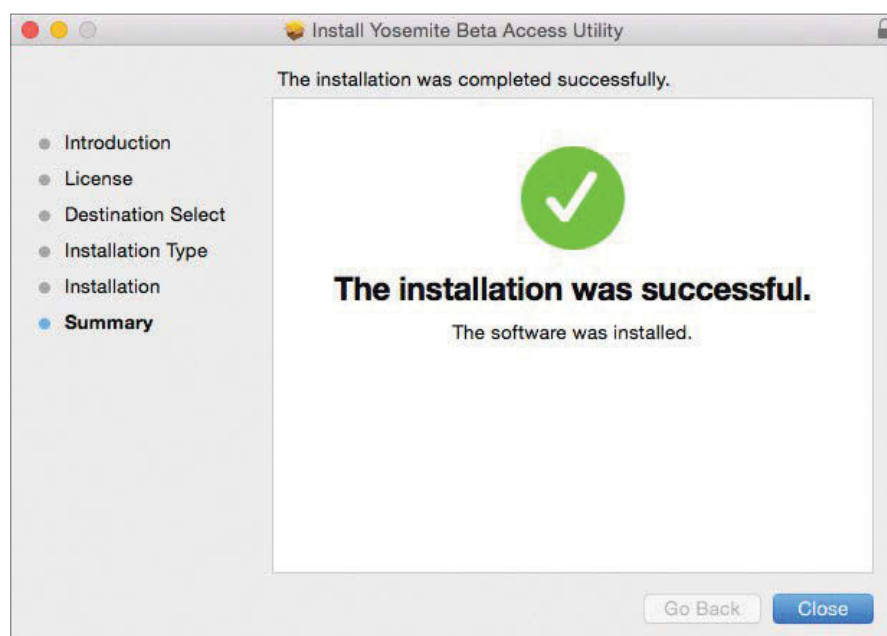
By clicking 'Join Now' and then 'Get Started' on the OS X Beta Seed Program website, you'll be taken to the 'Sign In' page. If you don't already have an Apple ID, you can create one by clicking 'Create one now' in the grey box on the left. If you do have one, however, you can go ahead and sign in using the password you normally use for your iTunes and other Apple services.

Next, you'll be taken to the OS X Beta Seed and Confidentiality Agreement. You'll need to read this and then click accept. Unless, of course, you don't agree with the terms, in which case you'll want to stop the registration process now.

### How to get your Mac ready for El Capitan beta updates

Apple gives clear instructions about how to prepare for the install on the Enrol your Mac page.

First, it advises users to make a backup of their data and files before installing any beta versions of OS X, stating: "Always back up your data and files before



installing beta versions of OS X. If you have multiple Macs, we recommend installing OS X Yosemite Beta on your secondary computer. Backing up files on a Mac is easy with Time Machine, the built-in backup utility in OS X."

Once you've backed up your computer, you can download the Beta Access Utility. You'll need to have OS X Yosemite installed and have 2GB or more of memory with 8GB or more of available space. Once downloaded, open the disk image, then double-click the package to run the installer and enrol your Mac for public beta updates. Note, there may not be any public beta software available at the time of install.

Click the blue 'Download Beta Access Utility' button to download the utility

## You must be aged 18 or older with a valid Apple ID, and you'll also need to be willing to accept the Confidentiality Agreement

(currently called Yosemite Beta Access Utility), and then click on package that has been downloaded onto your Mac to install it. The app will take up 826KB of space on your Mac. It can be installed on your Mac – no need to install it on a separate partition, this is just the means by which you will download the beta. Once installed, the app will launch the

Mac App Store, which will show you if any updates are available (currently there is a public beta for OS X Yosemite 10.10.4). Any updates that have not yet been released to the public, and are therefore part of the OS X Beta Seed Program, will be labelled 'Pre-release'.

You can click update to install those pre-release versions of software. Click 'Update' to install the most current version of the OS X Public Beta.

With each new release, the latest OS X Public Beta will automatically appear in the Mac App Store and you'll receive a Notification when it is available.

### How to provide feedback

Now that you've signed up to the OS X Beta Seed Program and have installed

the OS X beta, you'll be able to provide feedback to Apple about bugs and other issues that need to be fixed. You'll find the Feedback Assistant in your Dock (it's a purple circle with a speech bubble within it). Click it and then sign in with your Apple ID to begin providing feedback to Apple using the form that the Feedback Assistant provides.



## WHAT STEPS TO TAKE BEFORE YOU INSTALL OS X EL CAPITAN AND HOW BEST TO PREPARE YOUR MAC FOR IT

By Karen Haslam

**W**e've already looked at how to join the El Capitan Beta Seed Program (see page 20). In this article, we'll be looking at how best to prepare your Mac before you download the beta, as well as how to install it.

### How to install the beta on a Mac

The public beta program will let you download and run beta versions of OS X 10.11. Be aware that you will be testing pre-release versions of OS X El Capitan. Running a pre-release version of the software means that you should expect to experience bugs and performance issues.

When you receive the email from Apple there will be a download link and a redeem code. You will be able to download the Mac OS X 10.11 Installation from the App Store.

Follow these instructions:

1. Open the Install OS X 10.11 Preview file in the Applications folder
2. Click Continue

3. Click Agree and Agree
4. Click Install
5. Enter your Admin password

We don't, however, recommend that you install El Capitan on your main Mac – or if you must, then you should install it on a secondary partition of the Mac or on an external hard drive (more on that later). Either way, we'd recommend a full back up before you install it.



**The public beta program will let you download and run beta versions of OS X 10.11. Be aware that you will be testing pre-release versions of El Capitan**

El Capitan is a beta product, so not all of your apps and programs will work. Furthermore, you might find it crashes and is unstable.

### How to install the beta on an external hard drive

If you want to install the beta of El Capitan on your Mac, we recommend dual

booting the beta alongside your current edition of Yosemite. However, to do so, you'll have to wipe your whole system.

With a dual-boot installation, you are able to choose between using Mac OS X 10.11 El Capitan and 10.10 Yosemite.

Luckily, you don't have to install the El Capitan beta on your Mac at all – you can install it on an external hard drive. You'll want to use a fast drive if you can – Thunderbolt drives are comparable

to the internal drives on a Mac, but if you do not have a Mac with Thunderbolt then consider using a USB 3.0 drive.

Adding a second hard drive, formatting it and installing Mac OS X 10.11 El Capitan on it is the safest way to get a good look at the new operating system. It'll leave your current configuration intact and allow you to play around with Mac OS





X El Capitan. To install the operating system on a external hard drive follow the following steps:

1. Connect the external hard drive
2. Launch Disk Utility (choose Go → Utilities to find it)
3. Select the drive in the sidebar (the root drive, not the volume it contains)
4. Click Partition
5. Ensure that Partition Layout says '1 Partition'
6. Give it a name such as 'Mac OS X El Capitan'
7. Click Options and ensure that Guide Partition Table is selected. Click OK
8. Click Apply and Partition

Now download the OS X 10.11 installation from the Mac App Store and follow these instructions to install the beta on the hard drive:

1. Open the Install OS X 10.11 Preview file in the Applications folder
2. Click Continue
3. Click Agree and Agree
4. Click Show All Disks
5. Highlight the external hard drive
6. Click Install
7. Enter your Admin password

To run El Capitan, open System Preferences → Startup Disk. Select the drive you wish to start up the Mac and click Restart. You can also hold down Option during startup to pick the drive you wish to use to start up the Mac.

## How to dual boot the beta on a Mac

If you don't have a spare external hard drive (or the one you have is slower than you would like), you can partition the main hard drive into two separate drives and then install El Capitan on one and Yosemite on the other.

The only issue with this is that you will have to wipe your internal hard drive and reinstall Yosemite along with the new beta version. If you want to keep any of your current work, you'll need to create a backup of Yosemite and ensure that it will fit on your smaller partitioned drive. To create your partition follow these instructions:



1. Boot OS X into recovery mode (Hold down Alt during startup)
2. Use Disk Utility in recovery mode to wipe the main hard drive and split it into two partitions
3. Use the Install option in Recovery to install Yosemite on to the main partition
4. Next restore the data to Yosemite from your Time Machine (or other backup)
5. Follow the steps above to install the OS X 10.11 Preview on to the second partition

## How to dual boot the beta using Virtualisation software

You can also install El Capitan inside Yosemite using Boot Camp virtualisation software such as Parallels Desktop or VMware Fusion. The virtual route enables you to test out the operating system in a safe environment without affecting the Yosemite installation. We think virtualisation is the best option if you already have this software and just want to take a quick peek at the new features.

It is possible to install El Capitan within a virtual machine, but currently the developers of the virtualisation tools are scrambling to include support for the new operating system, so don't expect a simple install until they do, and you may find it runs slowly (or not at all).

## How to install El Capitan

Once the full version of El Capitan comes out later this year, the same rules will apply when it comes to downloading and installing the new OS as applied to Yosemite. When OS X 10.11 launches, it'll be available on the Mac App Store. For

now, you can find Yosemite there. If you haven't installed it yet, this is where to go. In order to download and install the new operating system, open the Mac App Store on your Mac. Before you do, though, you should prepare your Mac for the update by following the steps listed here. Also, it's worth noting that it could take several hours to download El Capitan.

## How to prepare your Mac for a new version of OS X

Just as with Yosemite, El Capitan is set to be free and pretty easy to install. However, before you perform any major update to the operating system, you should complete a few tasks to ensure that your Mac is ready to go.

### 1. Find out if your Mac will be able to run the operating system

This one is a biggy. If your Mac can't run El Capitan, then I'm afraid there's no new software update for you. Don't panic, though. If you're already running Mavericks, you'll be able to get Yosemite and the same will apply for OS X 10.11.

You'll find a full list of supported Macs on page 12.

### 2. Make sure you have sufficient RAM

If your Mac is on the list of supported machines, it's likely you won't run into any problems, but it's worth checking that you also have enough RAM. Apple says you'll need at least 2GB RAM, although 4GB is advisable. All of the supported Macs have at least 4GB RAM, so this won't be an issue.

### 3. Make sure you have enough space for the new version of OS X

Apple suggests that you should have 8GB of free space on your Mac's drive before you install a major OS X update, but we recommend aiming for 15- to 20GB. The Yosemite installer was 5.64GB, so expect similar, though you'll need to allow some room for temporary files.

### 4. Get access to the Mac App Store

If you are still running Leopard and don't have access to the Mac App Store, then you need to upgrade. The next version of OS X will be available only via the Mac App Store and the Mac App Store arrived with Snow Leopard. Luckily, you can still get hold of a copy of Snow Leopard from Apple. It costs £14.

### 5. Update your software

Before you upgrade to El Capitan, make sure you install the latest updates to Snow Leopard, Lion, Mountain Lion or Mavericks (whichever operating system you're currently running).

To ensure that you are up to date, click on the App Store icon in the Dock and select Updates. You can also click on the Apple logo at the top left of your screen and select Software Update from there.

### 6. Update your third-party apps

Make sure that you don't forget to update any third-party software on your Mac. Those may include changes that are required for upgrading and if you don't

run the updates they may not work properly once you have updated.

To update apps you've bought from the Mac App Store, launch the App Store app and click the Updates button in the toolbar. Click Update All, providing your Apple ID and password when prompted.

For apps that you purchased elsewhere, you'll need to manually install updates. You can check if these are available from the application's menu; in Microsoft Word, for example, it's a case of clicking on *Help* → *Check for Updates*.

Check compatibility with your third-party apps before installing any new operating system. That way you will be up and running immediately, rather than being frustrated by your favourite apps and add-ons not working.

### 7. Ditch really old software

If you're still running Snow Leopard (OS X 10.6), you may still be using a few PowerPC programs – software that was never updated to run natively on Macs with Intel processors. Apple used to provide software called Rosetta, which translated PowerPC code so it could run on Intel Macs. When Snow Leopard launched, Rosetta was no longer installed by default, but it was possible to download and install it if you wanted to run a PowerPC program. However, Apple killed Rosetta completely when it released Lion, and it remains unavailable to this day. Any PowerPC apps you have won't work when you update your system, so you'll either need to ditch

them and find alternatives, or stay in the dark ages and run very old software.

To find out if any of your applications are PowerPC programs, launch Snow Leopard's System Profiler utility (in / Applications/Utilities), select Applications (under Software in the sidebar), and then click the Kind column header, which sorts the list of applications by processor type. Any programs listed as PowerPC will not work with El Capitan. Indeed, they won't even work in Yosemite, Mavericks, Mountain Lion, or Lion.

### 8. Make sure your Mac is healthy

You should make sure that your Mac is completely healthy before installing a big update to the system. To do so, open Disk Utility (in /Applications/Utilities), select your startup drive from the list on the left, click the First Aid tab to the right, and then click Verify. If Disk Utility finds problems, you'll need to boot from a different volume to perform the repairs using the Repair Disk button. Boot into recovery mode (by holding down  $\text{⌘}+\text{R}$  at startup) and use Disk Utility from there to perform the recommended repairs.

You can also run the Apple Hardware Test (for Macs older than June 2013) or Apple Diagnostics (for Macs from June 2013 or later). Both tests check your Mac for other hardware issues, such as bad RAM.

### 9. Back up your Mac

Before updating to El Capitan, we recommend you back up your Mac, and test that the backup worked before you do anything else. You can use Apple's Time Machine to create a back up that will recover your Mac exactly the way you left it prior to the install, but alternatives include SuperDuper or Carbon Copy Cloner, both of which will create a bootable clone backup of your Mac.

### 10. Set up iCloud

When you install El Capitan, you are likely to be pestered for your iCloud details because these days it's heavily integrated into many apps and system services. Make sure you are logged into iCloud and enable syncing before you start updating and things should go smoothly.



# Consolidate your photo library

Glenn Fleishman reveals how to import, merge, and consolidate your libraries in Photos for OS X

**P**hotos for Mac is finally out, and that's a real 'finally' given how long we've all been wrestling with the limitations of iPhoto in OS X and Apple's early announcement of its replacement. Photos for OS X has a lot going for it, especially in speed. But it's also a ground-up rewrite of our Mac photo experience, and some pieces are missing, some moved, and some broken.

Here we'll answer some of your questions about Photos.

## Merging libraries

Several people have asked *Macworld* how to cope with multiple existing iPhoto libraries. One wrote, "Do I import them one after another into the new Photos for Mac? And which one will be the default System Photo Library?"

Like iPhoto, Photos can load just one library at a time and only convert libraries to its format. You can import a library other than the default one you used with iPhoto into Photos by holding down the Alt key and launching Photos. It then lets you select any iPhoto library you've already converted (either the original or the Photos-converted version) or click Other Library to find another one.

There's no tool in iPhoto or Photos for merging libraries, and you can only import photos and folders of photos from within Photos. You have a few different paths to take, although you will lose something no matter which route you opt for. That includes potentially losing metadata, location tagging, and edits. If you have Aperture, you can import multiple iPhoto libraries into its format, then import the Aperture library into Photos.

## iPhoto

You can export images either in their original unmodified form or in the 'current' form, which is the way they appear including any edits in the library. Select any set or all photos. Go to Export and from the Export dialog box, choose either Current or Original from the Kind pop-up



menu, then click Export. Select a destination and click OK. Drag the exported photos into the Photos library or use *File → Import* to select and import them. Repeat for each library.

## Photos

Launch Photos and select an iPhoto library you want to merge with another. After conversion, choose *View → Albums* and double-click All Photos. Select *Edit → Select All*. You then have two options. First, choose *File → Export Unmodified Originals* and click Export. This will exclude all changes to an image made within Photos or imported from iPhoto.

Alternatively, you can select *File → Export [number] Photos*, pick a format, and click the expansion triangle, then select Full Size from the Size menu. Unfortunately, while this preserves the current state, it exports all photos into either TIFF, PNG or JPEG formats, rather than the original file format.

Next, choose a destination. Close Photos and reopen it with the library you want to merge into. Drag the exported photos into the Photos library or use *File → Import* to select and import them.

If it's worth it to you to spend \$29.95 (£19.70), there's another course of action: the third-party utility iPhoto Library Manager from Fat Cat Software ([fatcatsoftware.com](http://fatcatsoftware.com)). The utility includes the ability to merge iPhoto libraries. A trial version allows you to preview what a merger would look like.

## Consolidate isn't a merger

The Consolidate feature works separately from Import, and doesn't allow you to 'consolidate' multiple libraries. In iPhoto and Photos, you can keep originals stored in folders, and only have the app keep track of changes and metadata. But those images can't be included in iCloud Photo Library, and keeping them outside of the Photos library also makes the library less portable.

Choose one or more images, up to the whole photo library, and then go to *File → Consolidate*. In testing, Photos asked for permission to access a folder outside its library, which we gave, and then crashed every time we tried this. One assumes either our library has a problem or Apple needs to fix this in a future update.

## The pause that refreshes

One final quick note about iCloud Photo Library. Unfortunately, Apple hasn't built a throttle into the upload or sync operations. So if you have gigabytes of files to upload, it will fill this entirely.

Based on our testing, it looks like Photos will download files already in your iCloud Photo Library and perform other background sync operations before uploading new files from the local Photos cache. However, in Preferences, you can click the iCloud button and then click Pause for One Day to give your broadband a break. Before the day is up, you can click Resume at any time.



# THE COMPLETE GUIDE TO USING PREFERENCES IN MAC OS X YOSEMITE

IN PART THREE OF OUR GUIDE TO SYSTEM PREFERENCES IN YOSEMITE, WE  
LOOK AT NETWORK SETTINGS, iCloud, EXTENSIONS, AND MORE

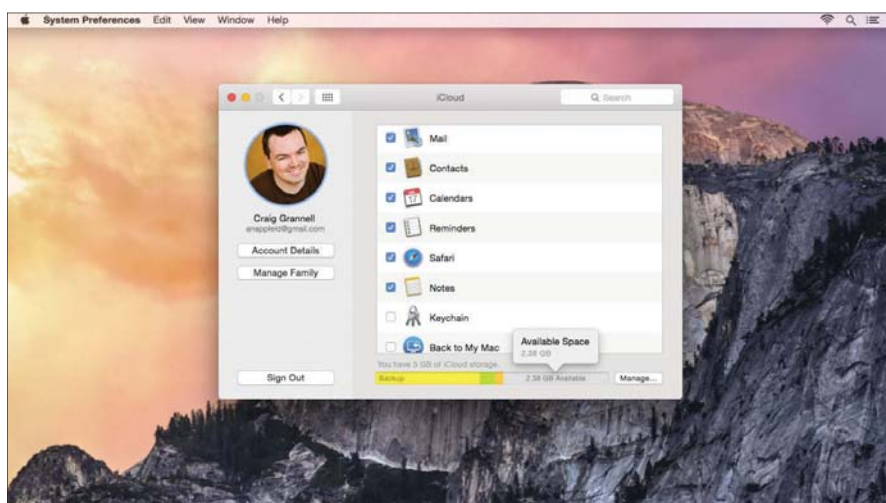
By Craig Grannell

This is the third part of our complete guide to System Preferences – you can find the other parts in our previous two issues. Over the following pages, we'll be looking at your different iCloud options, Network settings, and much more.

## iCloud options

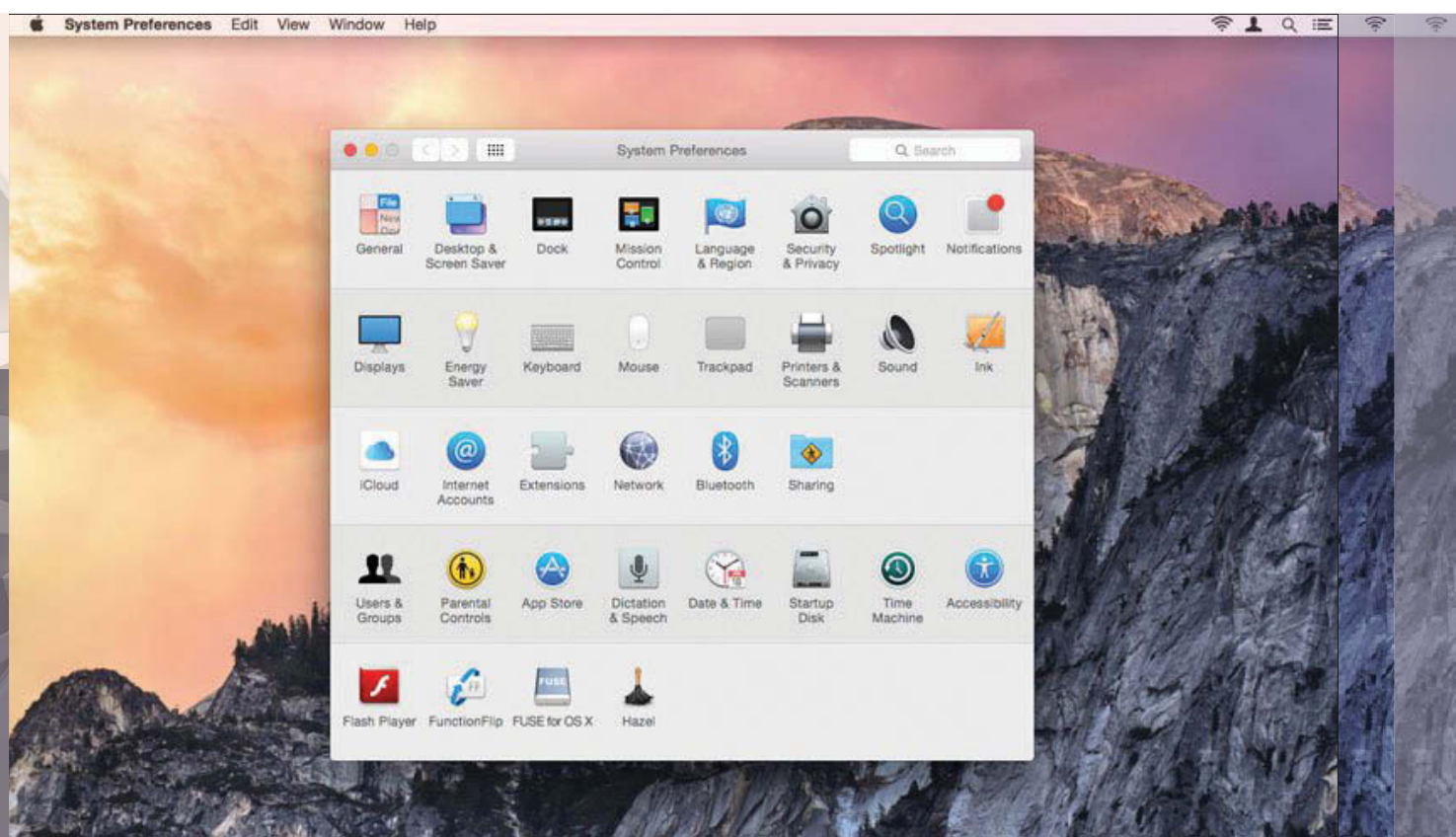
Using the iCloud pane, you can manage your details for Apple's iCloud service as well as the components that are activated on your Mac. If you haven't signed in, the pane will be two fields – Apple ID and password – and a Sign In button.

Once signed in, you'll see your avatar, username and iCloud email address to the left of the pane, along with Account Details and Set Up Family/Manage Family buttons. Click Account Details and type in your password to gain access to a sheet that enables you to edit the following: your name (under the General tab); email



addresses, primary postal address, and email marketing preferences (Contact); security details, including your birthday, password, security question, and rescue email address for an emergency account reset (Security); and primary payment method (Payment).

Set Up Family/Manage Family, respectively, enable you to set up or manage family sharing. Use the '+' button to add new family members by sending them an email invite. For a child without an account, you can create a new Apple ID for them.



Back in the pane itself, the larger right-hand area enables you to activate or deactivate various services and data types that iCloud can share between your devices. These include iCloud Drive (click Options to see an apps list); Photos; Mail; Contacts; Calendars; Reminders; Safari (bookmarks and open tabs); Notes; Keychain (passwords and payment data); Back to My Mac; Find My Mac.

Underneath, a bar details the status of your iCloud storage, for which Apple provides 5GB for free (and we think, could do with being a bit more

generous). If you need more space, click Manage and you can delete existing backups from iOS devices, or specific app data. Alternatively, click Buy More Storage and select an option to change your iCloud storage plan. For 79p monthly, you get 20GB in total; £2.99 gets you 200GB; for £6.99, you get 500GB; and at the top end of the four tiers, £14.99 per month gets you 1 TB. You can later downgrade if you no longer need the extra storage.

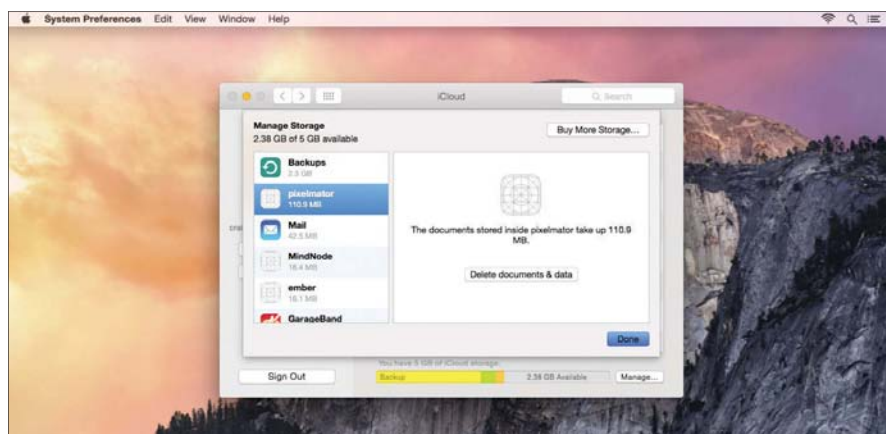
If you decide that you don't want to use iCloud at all on your machine, click

Sign Out. However, if you're using an iCloud account and password to log in to your Mac, you'll then have to click Stop Using iCloud and create a new password specifically for the Mac.

### Internet Accounts options

The Internet Accounts pane defines your online accounts at the system level, enabling services and apps to hook into them with your permission, potentially saving you typing in the same usernames and passwords time and time again. If you've already set up iCloud on your Mac, it will appear in the sidebar. To the right, you'll see a list of popular services you can add an account for.

To add a new account, click on a logo and a sheet will ask for information that's relevant for that particular service (usually a username and password, but sometimes other details, too). On adding your details and clicking Next, you may see an overview regarding what the service will be allowed to do with your data. For example, signing into Twitter allows you to post photos and show links from your timeline in Safari; sign into



Facebook and data will be integrated with Contacts and Calendar.

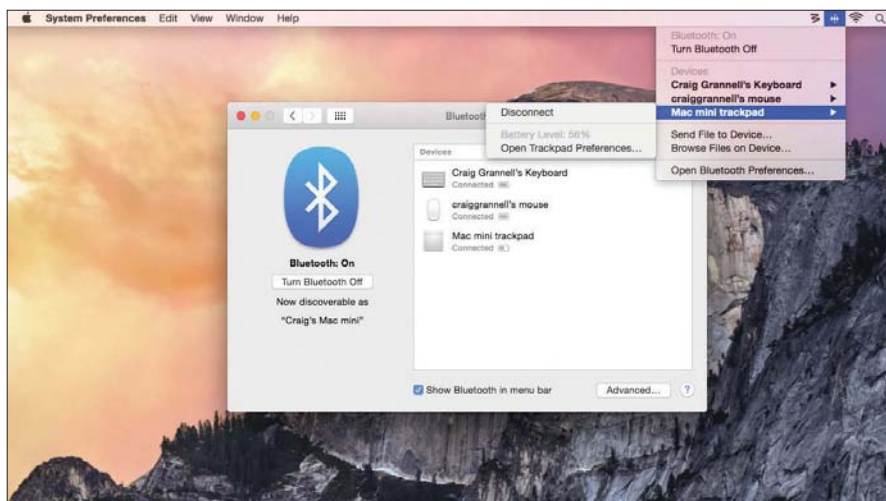
You can also add 'generic' accounts by scrolling to the bottom of the panel and clicking 'Add Other Account...'. In the sheet, choose the account type (Mail, Messages, CalDAV, CardDAV, LDAP, OS X Server) and click Create. You then fill in relevant details for the account, such as your name, email address and password for an email account.

Once accounts are created, they can be selected in the aforementioned sidebar. Doing so loads their information into the area where the service buttons are otherwise displayed, enabling you to update their configuration. For example, Facebook provides the means to disable the account or just its connection to Contacts and Calendars, along with buttons for grabbing new profile photos and updating your password and account description. Twitter also has a button for updating details in Contacts, and text fields for updating your password and account description. Any configured email accounts give you settings for updating the name, description and password, and apps the account is used with; behind an Advanced button, there's the means to update other aspects of the account's details, such as its IMAP hostname, the port used, and whether the account uses SSL.

To delete one of the accounts, select it in the sidebar and click the '-' button. Be aware that in many cases, deleting an account may remove data from relevant applications. Facebook offers a more nuanced approach: you get the choice of deleting Facebook contacts or keeping them, even if the account is removed.

## Extensions

A new pane in Yosemite, Extensions enables you to control and enable/disable installed Apple and third-party extensions that can be used to customise your Mac. You select a category (All, Actions, Share Menu, and so on) from the left-hand side of the pane, and relevant items are then listed on the right-hand side. Each can be activated or disabled, respectively, by checking or unchecking its checkbox.



Available categories and extensions will depend entirely on what applications you have installed on your Mac. A new Mac will lack third-party extensions beyond iTunes. However, install the likes of Dropbox and Fantastical and you'll see additional options.

The item categories are straightforward. 'All' lists all installed extensions and groups them by app. 'Actions' lists content extensions, such as Apple's own Markup, used for annotating imagery in compatible applications (like Mail and TextEdit) when you hover the cursor over an image and select Markup from the pop-up menu. 'Finder' lists extensions that directly integrate with Apple's file manager, such as Dropbox. 'Share Menu' enables you to control what appears in the Share menu found in supported apps, like Safari and Finder. And 'Today' determines

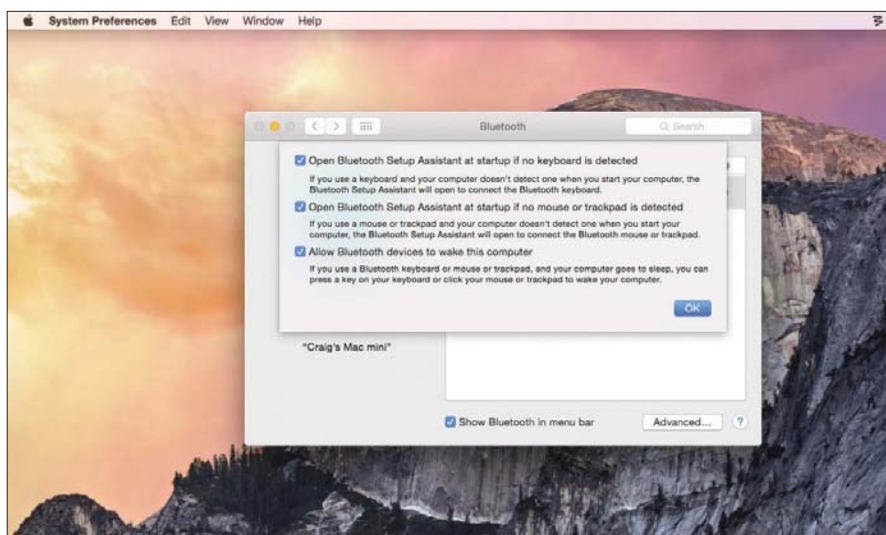
which widgets are available in Notification Center's Today view.

In all cases, disabling an extension in System Preferences immediately makes it unavailable system-wide. Note that app-specific extensions, such as those for Safari, are not yet listed in this pane.

## Bluetooth

The Bluetooth pane is used for controlling any Bluetooth devices your Mac is paired with. Using the button under the huge Bluetooth logo, you can turn Bluetooth on your Mac on and off; when it's active, your Mac's name is displayed under the button. (You may need to know it when trying to connect certain hardware.)

The main part of the panel lists devices paired with the computer and their current status. Hover the cursor over an item and a cross button appears, which when clicked removes the item from the







list. Note that if you remove an item and then want to use it later, you'll need to pair it again with your Mac.

At the bottom of the pane is a checkbox that enables you to show Bluetooth in the menu bar. This menu provides a faster means of turning Bluetooth on and off, along with enabling you to connect/disconnect hardware and ascertain its battery level. It can also be used to send files to connected devices and browse files already on them.

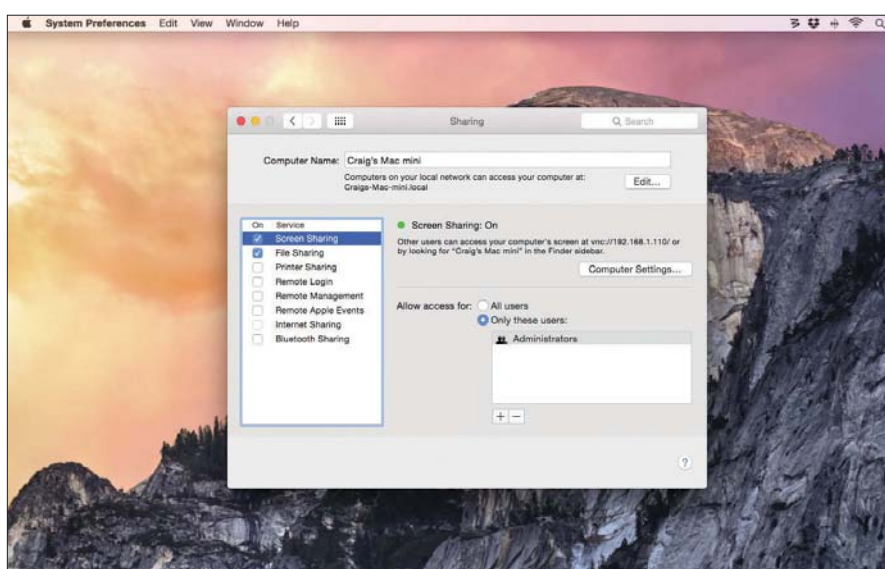
The Advanced button provides a few further options: opening Bluetooth Setup Assistant if no keyboard is detected at startup; doing the same if no mouse or trackpad is detected; and allowing Bluetooth devices (such as a keyboard or mouse) to wake the computer.

## Sharing

The Sharing pane opens up various aspects of your Mac to other computers on the network. The top of the pane shows the computer's name, which is editable, and the left-hand section lists services available for sharing. Tick a checkbox to activate the service. On selecting a service (regardless of whether it's active), its options appear to the right.

'DVD or CD Sharing' enables you to share a built-in or connected optical drive across the network. This is useful if you've a new Mac lacking a drive and an older one that happily takes CDs and DVDs. Note that data sent between machines is not encrypted and you can have the computer alert when someone else tries to use the drive.

'Screen Sharing' enables the Mac's screen to be shared. The 'Allow access for' section of the main pane provides control over who can access the shared screen: all users, or specified users and groups, added or removed using the '+' and '-' buttons. The 'Computer Settings' button provides access to allow anyone to request access, and to let VNC users control with a specified password. When Screen Sharing is active, the shared Mac can be found under 'devices' in the Finder sidebar of other machines; clicking 'Share Screen...' begins the sharing process.



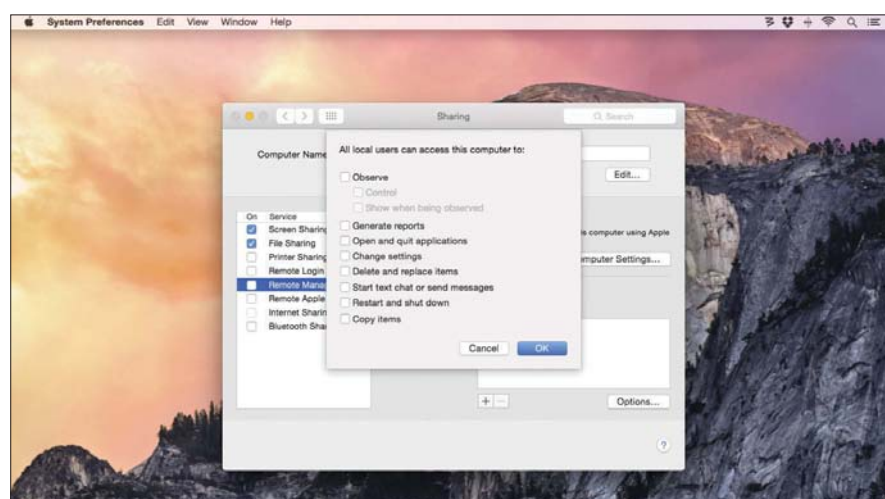
'File Sharing' activates a Mac's Public Folder, which has a Drop Box into which anyone on the network can drop files. (Once sent, said files are not visible to the sender.) The 'Options...' button in the System Preferences pane opens a sheet with settings for activating or deactivating connection types, and the 'Shared Folders' and 'Users' panels, respectively, optionally enable you to share additional folders and provide various access types to specific users or groups. Connect via Finder (select the computer in a networked Mac's Finder sidebar, then click 'Connect As...') with relevant username/password credentials and you can navigate all of the files/folders for the relevant account.

'Printer Sharing' provides the means for sharing a connected printer across the network. Aside from a button to open the

Printers & Scanners pane, there are panels for printers you can share and to state which users are allowed access.

'Remote Login' enables someone to log in to the Mac from another computer on the network, using SSH and SFTP. Again, you can define access privileges for individuals or groups.

'Remote Management' works with Apple's Remote Desktop, and is designed for people having to manage a network of Macs. There's the familiar field for setting user access, but it has an additional Options button (also seen when Remote Management is activated), which enables you to select tasks remote users are allowed to perform. Click 'Computer Settings...' and a sheet provides checkboxes for: showing Remote Management status in the menu bar; determining whether anyone may



request permission to control the screen; and stating a password for VNC viewers. Four fields can have information added for display in a System Overview report.

'Remote Apple Events', when activated on a Mac, allows applications on other Macs to send Apple events to it. An event is a task being performed on a Mac, such as opening a document or printing. So with this option activated, an AppleScript running on another Mac on the network could potentially open and print a document on your Mac.

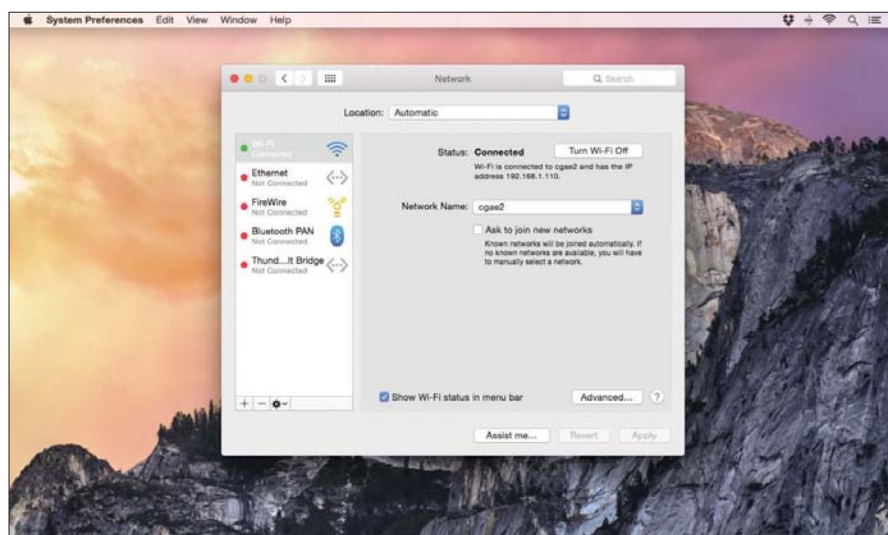
'Internet Sharing' makes it possible to share a Mac's internet connection from the source selected in the menu to another Mac's port, the type outlined in 'To computers using'. (Sources, such as Wi-Fi and ethernet will vary by Mac.) This can be useful for computers lacking connectivity, for example, sharing your Mac's Wi-Fi connection over ethernet to an old or damaged machine.

With 'Bluetooth Sharing' active, the Mac can share files with other Bluetooth enabled devices. The first two menus determine what happens when files are received (Accept and Save, Accept and Open, Ask What to Do or Never Allow), and where accepted items are saved. The second set of menus determines what happens when other Bluetooth devices browse the Mac. You can choose from Always Allow, Ask What to Do and Never Allow, along with selecting a folder others can browse.

## Network settings

The Network pane is where you define network settings, enabling you to connect to the likes of wireless routers or corporate ethernet. It's one of the more intimidating System Preferences panes, due to the sheer number of available settings and its relative complexity. However, the vast majority of users will rarely if ever have to venture into it, since more often than not just typing in a Wi-Fi password is all the networking effort most need to make.

In essence, the pane is split in three. At the top is the Location menu, which defaults to Automatic, but which can be used to define specific setups for different places, such as home, work



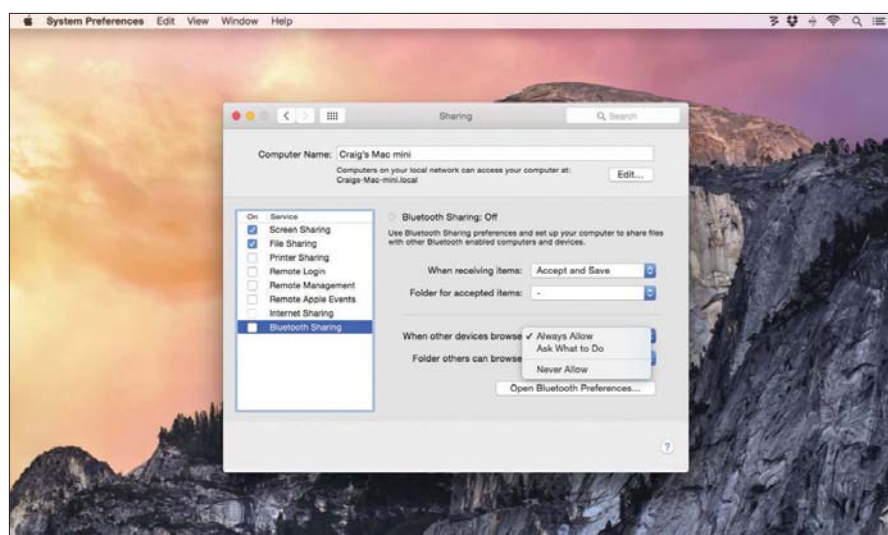
or regular overseas haunts. The left-hand pane lists available connection types (or 'services' in Apple language), and the largest part of the pane outlines the status and settings related to the currently selected service. The foot of the window houses three buttons: 'Assist me...', Revert and Apply.

If you only ever use your Mac in one place, with one connection type, there's no need to use Location. However, if your Mac needs to connect to multiple networks with settings that are more complex than simply selecting a different Wi-Fi network from the menu bar, defining multiple locations makes sense. To do so, select the menu and then 'Edit Locations...'. Use '+' to add a new location, '-' to delete an existing one, and the cog button to duplicate or rename the currently selected location. With more

than one location defined, a Location menu appears in the system-wide Apple menu; selecting an option there is usually faster than using the equivalent menu in System Preferences.

As noted, the left-hand pane lists available services, such as Wi-Fi, ethernet and FireWire. (The specifics will depend on your Mac's hardware.) A traffic light system denotes the status of a service: green for connected, red for off, and yellow for when on but not connected for some reason. On the last of those, text beneath the service's name may list a reason for the lack of connection.

The bottom of the pane has '+' and '-' buttons for, respectively, creating and removing services. On creating a new one, you choose an interface type and the service's name. Deletion is immediate but can be undone using



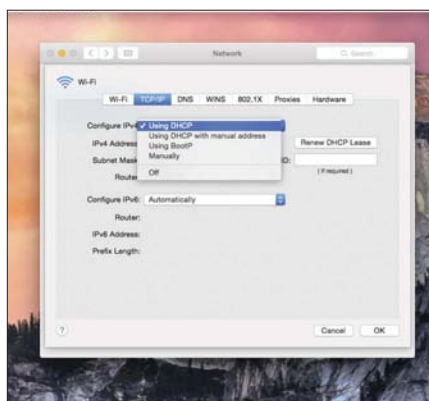


the Revert button. The cog button enables you to duplicate or rename the selected service, or to make it inactive. You can set the service order, to prioritise certain connection types. The other options include the means to import and export configurations, and 'Manage Virtual Interfaces', for editing a list of such interfaces.

Any time one of the services is selected, its status and relevant configuration menus are listed in the large pane to the right of the services list. For example, select Wi-Fi and you'll see its connection status, a button for turning it on and off, and details regarding the network's name and the Mac's IP address. Below this, there's a menu for selecting networks, a checkbox that determines whether the Mac asks to join new networks rather than connecting to known ones automatically, a checkbox for showing Wi-Fi status in the menu bar, and an 'Advanced' button. By contrast, select Ethernet and you'll get the service's status and the means to configure network settings. 'Using DHCP' is the default, but choosing 'Manually' provides fields for inputting IP address, subnet mask and router details.

The Advanced button opens a multi-tabbed sheet that enables you to drill down into the fine detail of network connections. Available tabs will depend on the selected service, but may include: Wi-Fi, TCP/IP, DNS, WINS, 802.1X, Proxies, Hardware and Bridge Status.

The Wi-Fi tab is the one users are most likely to need at some point. It enables you to reorder known Wi-Fi networks, and it's best to drag most-used ones to the top, to avoid your Mac wasting time first



searching for the others when trying to connect. You can select and delete any you no longer need (such as temporary airport, cafe and hotel connections you're unlikely to use again). When ticked, the 'Remember...' checkbox makes it quicker to access a network previously joined (albeit with the potential to clutter the list, as already mentioned). Subsequent checkboxes are primarily concerned with restricting network meddling by users, and are only worth activating in locked-down environments or for accounts created for inexperienced users.

TCP/IP is the protocol used to connect your Mac to the internet. Generally, connections will be automatic. However, if you've been provided IP, subnet mask and router details to manually input, this is where you do so. The tab also includes a 'Renew DHCP Lease' button, which is worth knowing about, because it forces your Mac to renew your current IP address; this can be useful in circumstances when there are many devices on the network and there's a clash that kicks your Mac off of a previously stable connection.

DNS server details are generally provided automatically. DNS is how computers associate domain names (such as macworld.co.uk) with numerical IP addresses. Some people prefer to override default DNS settings with the likes of Google Public DNS (8.8.8.8 and 8.8.4.4), which can under some circumstances be faster. There are also services for circumventing geolocation blocks through using specific DNS settings, thereby enabling you to access online content restricted to specific countries or get around blocking in

certain territories. The DNS tab is where you'd add such settings.

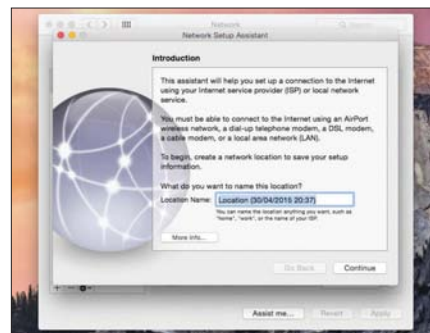
WINS may be required if you connect to remote networks that use NetBIOS names; 802.1X is used to control access and beef up security, and network administrators will advise when you need to add or amend a profile; and proxies can be used to filter internet traffic – again, something only likely to be required in corporate environments, with you being assisted by an admin. Hardware displays your MAC Address network identifier, and has a Configure menu that when set to Manually enables you to adjust the MTU (Maximum Transmission Unit) setting.

When any changes are made, click Apply to confirm them. Now imagine the next line is in three-metre-high neon letters with a klaxon blazing alongside: do not make any changes to your network settings – and especially the more esoteric ones – unless you know what you're doing. This isn't a pane to mess about in, and you could find your Mac rather rapidly disconnected from the web and very alone on your office desk.

Still, if things do go wrong, clicking 'Assist me...' might help. You get two options here: 'Diagnostics...' provides checks regarding your current settings, attempting to squash any network issues your Mac might have; and 'Assistant...' launches Network Setup Assistant, for walking you through the process of creating a new internet or local network connection.

## Users & Groups in System Preferences

The Users & Groups pane is where you create and modify accounts for the current Mac. Even if the Mac has only one





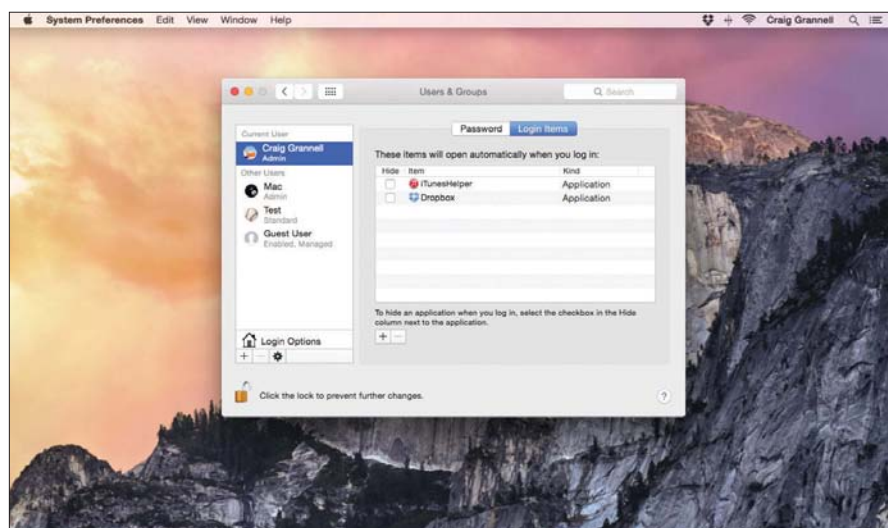
user, the ability to create new accounts can come in handy for troubleshooting; however, for any Mac used by multiple parties, understanding Users & Groups is extremely important from a security and Mac maintenance standpoint.

The pane has a padlock at the bottom. In order to make any changes to the pane's settings, click it and enter an administrator's username and password.

Accounts are listed in the left-hand sidebar. The current user is displayed at the top, and the others beneath, in the section 'Other Users'. For each user, you're shown their login image, account name, and account type.

Select the current user's account; the right-hand section of the pane will offer two tabs: Password and Login Items. Click Password and you'll see the account's icon, which you can click to edit. A new image can be chosen from a built-in selection, recently used images, Photo Stream, Faces, your camera, or 'linked'; the last of those includes images associated with the account.

Click the 'Change Password...' button if you want to update the account's password. If the account uses an iCloud password, you'll get the option to use a separate password or to change the iCloud one; on updating a password, you'll need to enter the old one, compose a new one, verify the new one, and add an optional hint. Any hint should be quite vague – do not type in something too close to the actual password, if you want your Mac to remain secure.



At the bottom of this tab is a button for opening the Contacts card for the current account, and two checkboxes; these denote whether the user can administer the computer, and whether parental controls should be enabled. Both checkboxes will be greyed out (and therefore cannot be changed) unless the current user is an administrator.

Under the Login Items tab, you'll find items that automatically open when the account logs in. Quite often, background utilities will be found here. New items can be added using the '+' button and choosing an item from the sheet. Applications are the most common login items, although you can also select documents. Existing items can be removed by selecting them and clicking the '-' button. Too many items in the list may result in slower Mac startups and

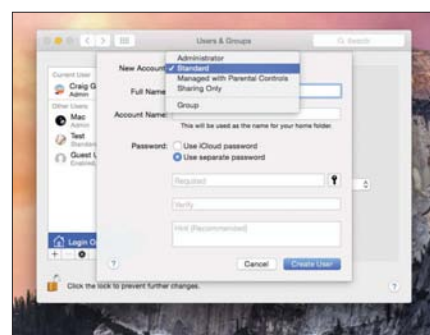
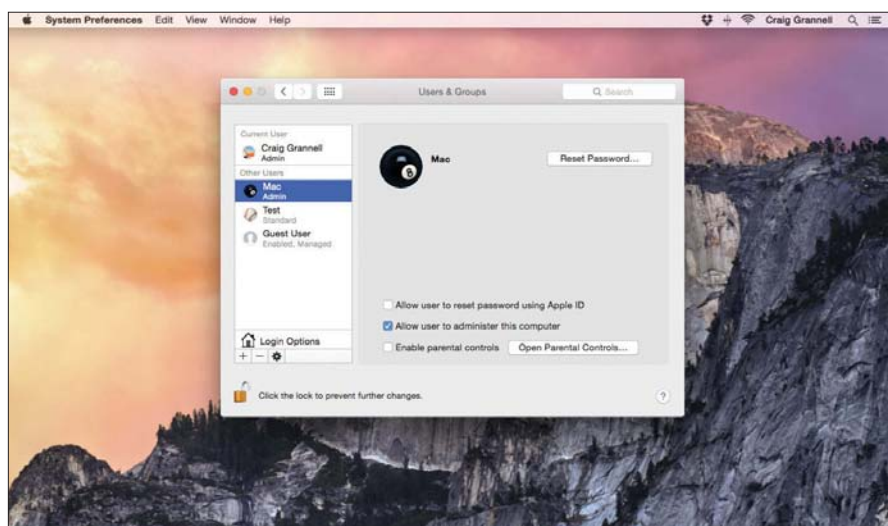
even system conflicts. If there's something in the list you don't recognise, search for it online and if you deem it unnecessary, delete it from the list.

When an administrator is logged in, they have some control over other accounts. On selecting one from the 'Other Users' section in the sidebar, they can perform a password reset, allow admin accounts to reset the account password using an Apple ID, and toggle admin status/parental controls. Note that if another user's account is logged in, it cannot be selected in the sidebar.

Administrators also have access to the controls at the foot of the sidebar, which are for defining login options, and for creating/deleting accounts. Select Login Options and you will see a number of things that can be changed. Automatic login is on by default for a new Mac, but is best disabled for security reasons; doing so forces a password to be entered when logging in.

Beneath this is a setting for how the login window appears. The default shows a list of users, one of which is clicked before a password is entered. 'Name and password' is plainer and a little more secure, since you must enter both the username and password. Five checkboxes then provide a range of further settings for the login window and account management: 'Show the Sleep, Restart, and Shut Down buttons' displays those buttons on the login screen; 'Show Input menu in login window' displays on the login screen the menu that enables





some other problem is to blame (such as dodgy hardware or software).

Note that within the 'New Account' menu there's also a Group option, which only requires a name to be entered. On creating a group, you add existing users as members. You can then elsewhere assign shared file access privileges to the group.

To delete a group, select it, click the '-' button and then confirm your choice. To delete an account, select it, click the '-' button, and then decide what you want to do with the account's home folder that contains all of the user's documents and data. You can save it to a disk image, leave the folder in place, or delete it entirely. On making a decision, click Delete User and OS X will perform the chosen action. Note that if you're backing up your Mac, deleting someone's home folder may remove it from the backup, and so only choose 'Delete the home folder' if you're certain you (and/or the account owner) no longer needs access to the data within.

Finally, the cog icon when clicked enables you to set a master password for FileVault, which can be activated in the Security & Privacy System Preferences pane. If the password is forgotten, encrypted data within FileVault will be inaccessible.

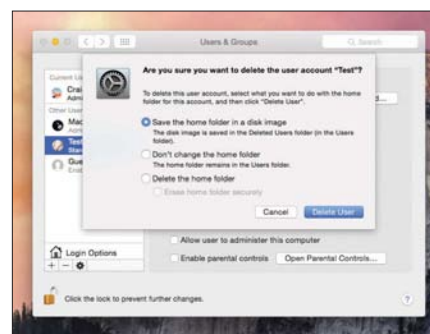
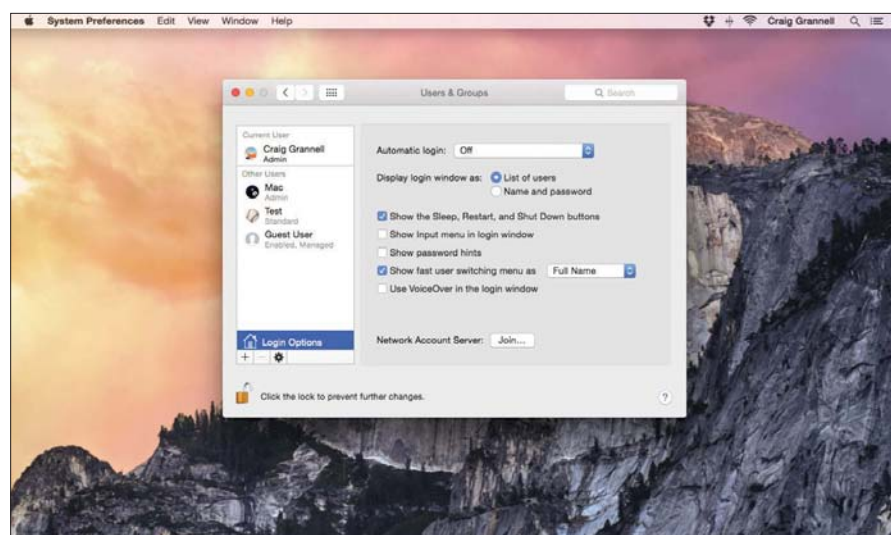
you to switch languages (and keyboards), which is useful if people using the Mac require and are used to different keyboard layouts; 'Show password hints' determines whether hints are shown when a password is forgotten; 'Show fast user switching menu' provides options to place a switching menu in the OS X menu bar, and this can be displayed as the account's full name, account name, or just an icon; and 'Use VoiceOver in the login window' is self-explanatory.

A button beneath the checkboxes provides the means for entering the address of an Open Directory Server or Active Directory Domain during login.

## Creating and deleting accounts in System Preferences

Below Login Options are '+' and '-' buttons, which, respectively, are for

creating and deleting accounts. Click '+' to open the new account sheet, in which you must first define the type of account: Administrator, Standard, Managed with Parental Controls, or Sharing Only. In all cases, you need to provide a full name for the account, an account name (OS X will automate this – turning the likes of Name Surname into 'namesurname' – but this can be overridden; the result will be the name of the account's home folder), and decide on the password that's to be used – either an iCloud password or a separate one. Click 'Create User' and the account will usually be created within a few seconds. Creating a new account can also be a good idea if your Mac is being strange. Log in to the account and see if the same issues occur; if not, they're most likely related to something on the original account; if so,







# MACBOOK WISHLIST

## FIVE THINGS THE NEXT-GENERATION MACBOOK NEEDS

By Susie Ochs

**P**laying with the new MacBook recently, I kept having flashbacks to 2008. Remember the first-generation MacBook Air? It captured everyone's imagination the instant Steve Jobs pulled it from a plain manilla envelope on stage.

Just like this new MacBook, the original Air's form-factor was pretty insane for its time, and Apple had to make some pretty big sacrifices to get the Air that small. No ethernet, no FireWire, and a weird little trap-door you had to flip open to get to the one USB 2.0 port it did have. The

keyboard didn't light up, and it didn't have anywhere near enough storage.

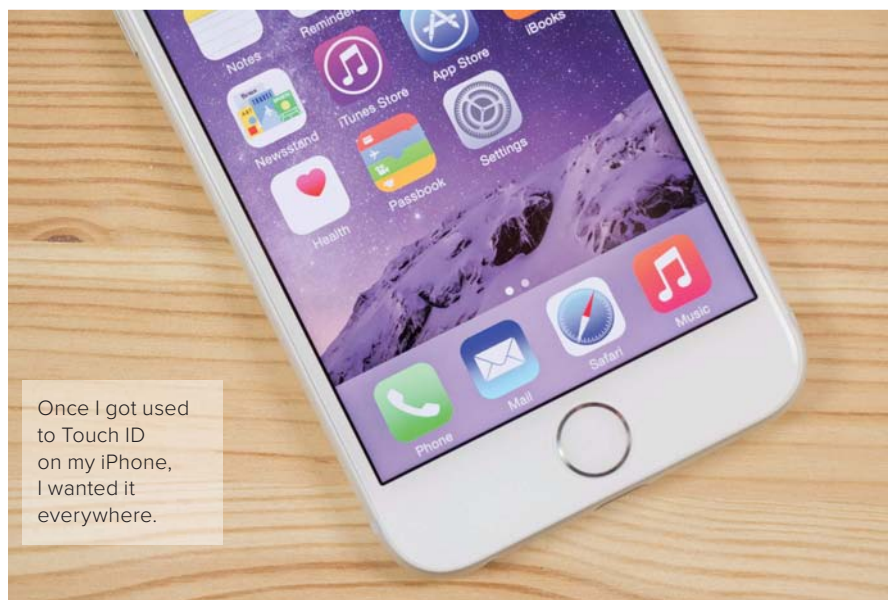
But guess what? That was all rectified in the second generation. The 2010 MacBook Air refresh didn't bring back everything we'd lost, but Apple did ditch the trap door, beef up the storage, and reilluminate the keyboard. And we wound up with almost the same MacBook Air I still enjoy typing on today.

Likewise, I think the new MacBook – shiny gold beauty that it is – will improve significantly in a year or two. Here's what I'd like to see in the second generation. (And I'll skip such obvious things as another USB-C port, faster processor, and lower price.)

### Touch ID

Having to type my Apple ID password into iTunes to buy a song or an app on my Mac feels outdated now that I have Touch ID on my iPhone and iPad.

Adding this to a laptop would fix that, plus let me unlock the computer itself biometrically. Indeed, if Apple threw in a



Once I got used to Touch ID on my iPhone, I wanted it everywhere.





**Come on, Jony.** Design some wireless charging furniture. You and Marc Newson can do better than IKEA.

secure element and enabled Apple Pay, and I'd buy even more stuff online.

### Wireless charging

According to Apple, the new MacBook is all about being wireless. "Fully equipped for a wireless world," reads its page on the company's website, but I have a little niggle with that claim. Where's the wireless charging?

All-day battery life is great, and I tend to believe Apple's claims, since I can already go almost all day on my 2013 Haswell-equipped MacBook Air. But the time has come for at least something with an Apple logo on it to not have to be tethered to charge. Indeed, IKEA has just announced a range of furniture with integrated Qi wireless charging pads. Jony Ive and his design crew could team up with some furniture designers to make the most beautiful wireless charging station the world has ever seen.

### Cellular networking

Speaking of going wireless, Apple specifically mentioned how easily the new MacBook could get online by tethering to your iPhone and using its data connection. Well, not my iPhone. I'm still clinging to the same data plan that I got with my first iPhone in 2008. The downside to this is that it doesn't support tethering.

So I for one can't wait until Apple offers a laptop with a cellular radio. I purchase Wi-Fi-only iPads, but I mostly use them for entertainment. My Mac laptop is for work and I work online, so I would pay a premium for the peace of mind of knowing that I could connect anywhere I can find a signal. Perhaps a prepaid Wi-Fi hotspot is the way to go since that would get my iPad or my Mac online, though it would be another device that I'd have to carry around and keep charged.

### Make it spillproof

Apple touted a few specific features of the MacBook's redesigned keyboard. The keys, for example, are larger and have a new butterfly mechanism instead of scissor switches. However, no matter what kind of keyboard you have, spilling a glass of orange juice on it is bad news.

The Apple Watch has a water-resistance rating of IPX7, and with its paucity of ports, the new MacBook could be Apple's first water-resistant computer. (Orange juice resistance may still be a few years off...) If Apple could shrink the height of its keyboard by a good 40 percent, making it and the fancy new



**MacBooks at the** Windows 10 unveiling.

Force Touch trackpad spill resistant seems like a good next step.

### Light 'em up

I remember being distinctly disappointed that the first-generation MacBook Air's keyboard didn't light up. Thankfully, that handy feature came back in the 2010 model. Likewise, with its new MacBook, Apple removed the illuminated logo on the back. It's now just a shiny metallic Apple logo, just like you'd see on an iPad. I know it's a small thing, but I want it back.

Or maybe it's not such a small thing. Yes, it doesn't have a practical application, but that glowing Apple logo is an icon. At this year's CES, I took a second to look around the crowds when covering big tech events and press conferences, and I always got a little thrill to see a sea of glowing Apple logos perched on the laps of rows and rows of journalists. (Especially if the press conference is, say, Microsoft's.) Gold is nice. But it doesn't glow. Please, Apple?

### One more thing: a DVD drive

Just kidding.





# NETWORKING MACS

## HOW TO NETWORK MACS TOGETHER AND SHARE FILES BETWEEN MACS AND PCS OVER THE NETWORK

By Kenny Hemphill

**W**hen I first started writing about the Mac, networking involved multiple protocols, cables, hubs, routers, switches and crossed fingers as you attempted to configure the whole thing in the operating system.

Wi-Fi has done away with the cables and while there are still several protocols, if you want to connect Macs and Windows machines on a network, the only two you need to worry about are AFP and SMB. Now, when you connect your Mac to a Wi-Fi network on which there are other Macs and PCs, by default you'll see them pop up in the Finder's sidebar.

There's still a great deal you can do, however, to configure settings and make

sure everything runs as you want it to and, importantly, you only share files and folders you want to share. The magic all happens in the Network and Sharing panes of System Preferences.

The guidance here assumes that the computers you want to connect to and share with are connected to the same router, either wired or wireless, and have been allocated IP addresses. You can check this in the Network pane of System Preferences, in either the Ethernet, for wired, or Wireless tabs.

### Connecting a Mac to a PC shared folder

Before you start, it's worth noting that if you share an administrator account on a

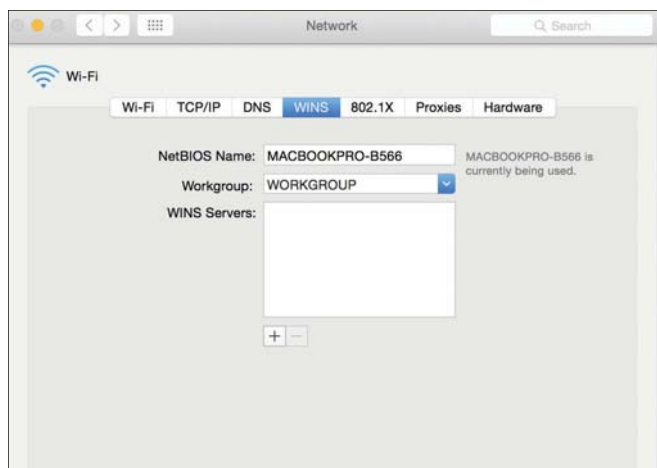
Mac, you'll allow access to everything accessible from that account. It's good practice to set up a specific account for sharing and thus limit access to only the file and folders you want to share.

To connect to a Windows PC from your Mac, you'll need the PC's network name and the name of the workgroup on which it sits. You can find those in the System Control Panel in Windows (press the Windows key and Pause together in Windows 7 or 8).

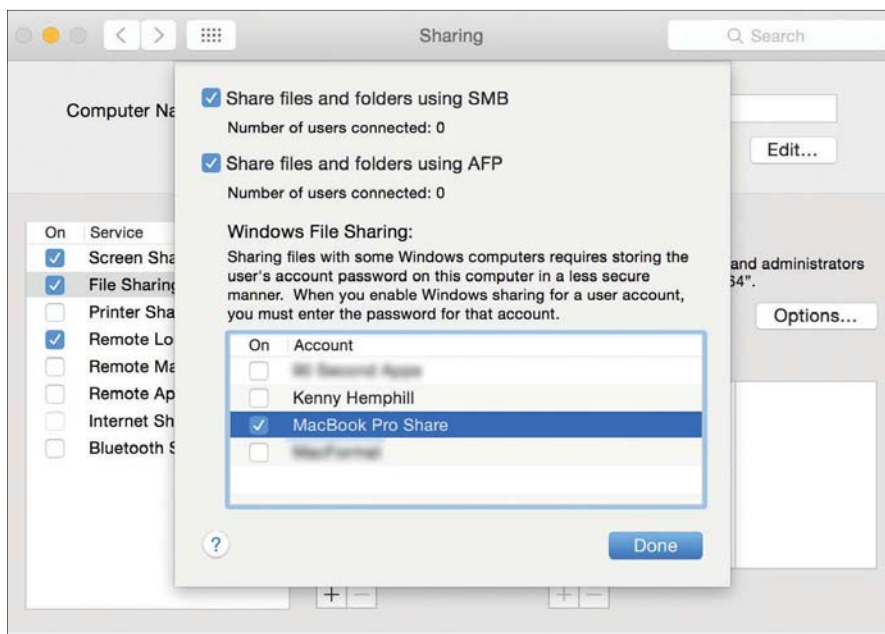
Armed with those details, go to *System Preferences* → *Network* on your Mac, click on the network you're connected to (Wi-Fi or ethernet) and click the Advanced button. Click the WINS tab on the next window and in the box next to NetBIOS



Create a new account on your Mac for sharing.



Add the name of the Windows workgroup in the WINS tab.



#### Enable file sharing using SMB.

Name, type a name that will identify your Mac on the PC network. Click the arrow next to the Workgroup box and select the workgroup name you collected earlier. If it's not there, type it into the text box. Click OK then Apply.

There are two options for connecting to the Windows PC. The simplest is to open a Finder window and check the sidebar to see if the PC is there. If it is, double-click it to connect. You should see a login window. If the PC has guest access enabled, click the Guest button. If not, you'll need to type in the username and password of a user account on the PC. When you've logged in successfully, you should see a window with a list of shared folders in it. Click on the one you want to connect to and click OK. It should now appear in the Finder's sidebar. And

you can access shared files and folders on it. To disconnect, hover over it and click on the eject symbol.

If the PC doesn't show up in the Finder, click on the Go menu and select Connect to Server, or press ⌘-K in the Finder. Type **smb://[pcname]** where **[pcname]** is the name of the PC you want to connect to. You should now see the log in window and you can proceed from there.

#### Sharing files from your Mac over the Network

The first step in sharing files and folders on your Mac is to create a specific user account for the purpose. That way you can be absolutely sure that you control what's being shared.

Go to the Users & Groups pane in System Preferences, click the padlock and enter the administrator username and password to allow you to make

changes. Press the '+' button under the list of user accounts to create a new account. When the dialog box opens, select 'Sharing Only' from the menu next to New Account. Fill in the name details and give it a password. Click Create User.

Next, go to the Sharing pane in System Preferences and tick the box next to File Sharing. Click the Options button, check that 'Share files and folders using SMB' is ticked, and tick the box next to the account you just created. Make sure no other account is ticked. Now, if you want to connect to your Mac from a Windows computer, you'll have to do it using that account. You won't be able to connect to any other account.

You can still, however, connect from another Mac to any account on that Mac. You can add any folder from the account you're currently logged into, and specify how users are able to access that folder.

#### Connecting to a Mac from a PC to copy files

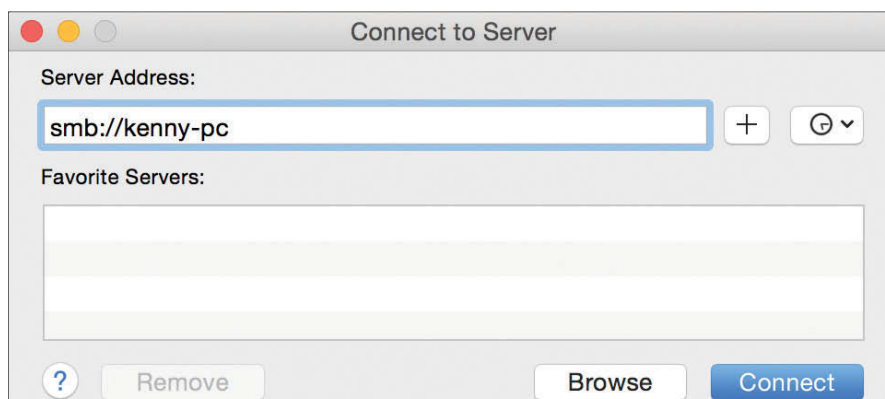
Once you've set up file sharing on your Mac, go to the PC and open Explorer. Click on Network (if you're asked to enable Network Discovery, do it) and you should see your Mac in the window. Double-click the Mac's name and in the box that opens, type in the username and password of the account you just created. You should now see the shared folders in Windows.

An alternative method is to click on the Start menu, then select Run and type in the name of the Mac or its IP address, then click OK. You can now copy files to and from the shared folders on the Mac.

#### Networking problems

If you can't connect from the PC to your Mac, try resetting the password in Users & Groups in System Preferences and logging in again from the PC with the new password. If that doesn't work, head to the Security & Privacy pane in System Preferences, click the Firewall tab, then press Firewall Options and make sure File Sharing (AFP, SMB) is set to 'Allow incoming connections.'

**Connecting to the remote server.**





# QUICK FIXES

## 6 fixes for common Mac problems

DISK UTILITY AND ACTIVITY MONITOR CAN RESOLVE MAC PERFORMANCE ISSUES. HERE'S HOW THEY WORK

By Kenny Hemphill

One of the reasons many of us use a Mac is that most of the time it just works. We don't have to spend hours dealing with driver updates or fixing problems caused by bloatware.

Occasionally, however, even on a Mac, things do go wrong. Fortunately, OS X comes bundled with several tools to help you diagnose and fix problems very easily. The two most useful are Disk Utility and Activity Monitor. Here are a few ways you can use those two utilities to identify why your Mac is not working as well as it should and then resolve the issues.

### 1. How to fix your startup disk

A Mac that won't start up is one of the most frustrating and frightening problems most of us encounter, but it's usually easily fixed. First, you need to reboot your Mac from its Recovery Partition, if you're running OS X Lion or later. If you have an earlier version of OS X installed, boot from its install DVD.

If you're using the Recovery Partition, reboot while holding down  $\mathbb{C}$ -R. If you're booting from an install DVD, hold down C while it restarts. When your Mac has booted using the Recovery Partition, you'll see an Utilities Window. Select Disk Utility. If you've booted from a DVD,

choose Disk Utility from the Install menu. Click the First Aid tab and then click on your startup volume. Make sure that you click the volume, and not the disk at the top of the list. Click Repair at the bottom of the window and Disk Utility will verify and repair the startup disk. When it's done. Restart normally.

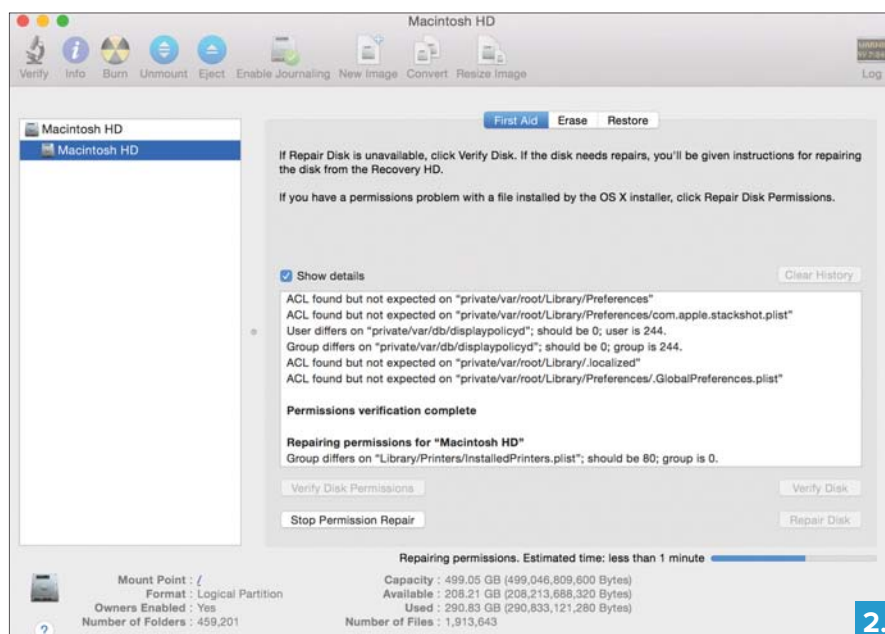
### 2. How to repair disk permissions

If your Mac starts up okay but some applications behave erratically, disk

permissions, which control what each user can do with files and folders, may be to blame.

Thankfully there's a very easy fix, and again, it's Disk Utility to the rescue. Launch Disk Utility, either by firing up Launchpad and searching for it there, or by navigating to the Utilities folder ( $\mathbb{C}$ -Shift-U in the Finder) in Applications, and opening it from there.

Click on the First Aid tab. Click on your startup volume in the left-hand pane. You



now have two choices, you could click Verify Disk, which may save you some time if it turns out there's nothing wrong with the disk. But, as we're pretty sure there is something wrong, you can go straight to Repair Disk Permissions and click that. Disk Utility will start identifying and fixing problems, which could take a little while. You'll see a list of problems and fixes in the Disk Utility window as it goes through them.

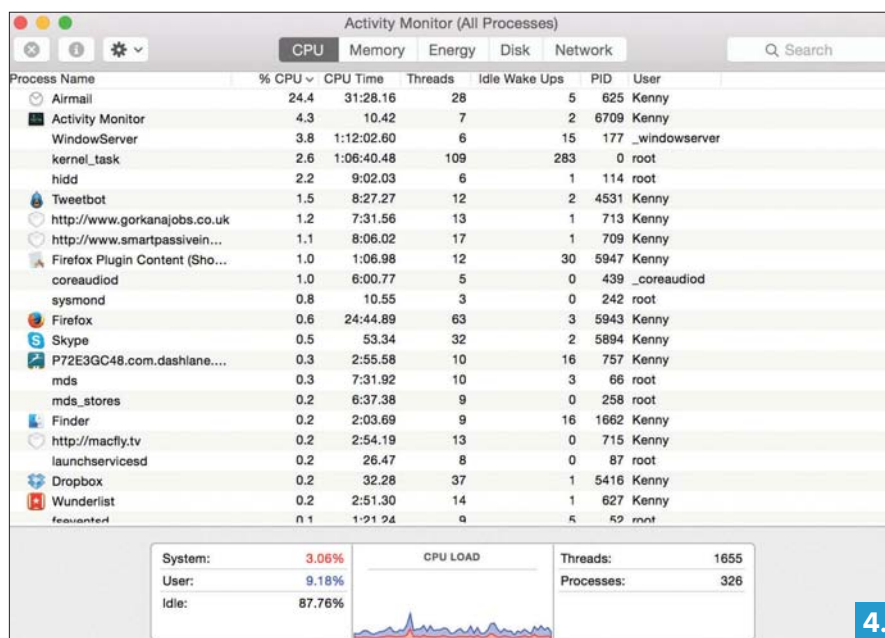
Once it's done, you can quit Disk Utility and carry on using your Mac as normal.

### 3. Identify memory hogs

If your Mac is running slowly, there are a number of possible reasons and culprits. Your first port of call should be Activity Monitor, stashed in the Utilities folder in Applications. Launch it and you'll see five tabs along the top (four if you're running Mountain Lion or earlier), and a list of processes underneath. Click on the Memory tab. Look at the bottom of the window and you'll see a graph of memory usage. If it's green, everything is working as it should be. The tables on either side show you how your Mac's memory is being used.

OS X, in addition to using physical RAM (Physical Memory) itself, allocates some to apps (App Memory), and also uses it to cache recently used files (File Cache). If it starts to use close to the maximum physical RAM available, it compresses data that hasn't been used recently to save space (Compressed). If it needs more it moves the compressed data to disk (Swap Used), and if it needs more still, it uses disk space as memory for applications (Virtual Memory).

If the graph is amber or red, OS X is having trouble managing memory, perhaps because an application or process is hogging it. To find out which process is at fault, look at the memory column. Make sure that it's sorted by highest to lowest usage (arrow pointing downwards).



Ignore processes that have 'root' listed as the user and focus on those running from your user account. If you see an application or process that's obviously hogging memory, quit it by clicking on it, then clicking the 'x' icon in the toolbar. Don't quit 'root' processes.

It's a good idea to restart your Mac once you're done.

### 4. Find out which applications are hogging the CPU

Click on the CPU tab and you'll see information similar to that in the Memory tab. The graph at the bottom shows user (in blue) and system (in red) CPU usage. If you see an application that's using a significant chunk of CPU cycles, quit it and you should notice a performance improvement in your Mac.

If a root process appears to be hogging the CPU, don't just quit it, it's usually a symptom of another problem. Google the process name and find out what it does. One regular culprit is 'kernel\_task.' It represents OS X's kernel and handles lots of low-level tasks. If it's using more than a few percent of processor cycles, it could be that you've installed a system

extension, or other software that accesses the system, which is causing a conflict. In some cases, users have reported that the MacBook Air, when the ambient temperature is very hot, runs very slowly and this shows up as 'kernel\_task' hogging CPU cycles. The best solution is to move it somewhere cooler.

### 5. Check the energy use of apps

The Energy tab was a new addition in OS X Mavericks. It's useful if your Mac is running on battery power and want to keep tabs on which apps and processes are using the most energy. While the battery menu in the Finder's menu bar will tell you which apps are using significant energy, Activity Monitor shows you how much energy all open apps are using and how energy usage as changed over time.

### 6. Check disk space and network

These two tabs deliver similar information to the CPU and Memory tabs, showing you how much disk space and network bandwidth open applications and running processes are using. Disk is useful if your Mac is very low on disk space – although you should always keep at least 10 percent free – as it will show you which apps are using lots of disk space while they run. Network will show you how much data each app is reading and writing over the network, and displays a graph of overall network traffic over time.

Occasionally even on a Mac, things do go wrong. Fortunately, OS X comes bundled with several tools to help you diagnose and fix problems very easily

# CONNECT TO MAC FROM iOS

VIEW THE DESKTOP OF YOUR MAC OR PC FROM AN iPad, iPhone OR IPOD TOUCH WITH OUR QUICK AND EASY GUIDE

By Keir Thomas

Accessing a computer on the same network as your iPad, iPhone or iPod touch is usually just a matter of entering the local network IP address or computer name when prompted in the apps discussed below.

However, accessing your computer from outside the home or office is more complicated. You'll need to configure your router so that the relevant ports are passed through to the computer you want to connect to. It's also a good idea to configure a dynamic DNS service, so that you can connect via a hostname rather than an IP address, which is prone to changing. Examples of dynamic DNS services include NoIP and DuckDNS, which are free of charge, but how they're configured is again outside the scope of this article. There are many guides available online – just search using your router model number and 'dynamic DNS'.

## Setting up your Mac and iPad for screen sharing

Mac OS X uses the established Virtual Network Computing (VNC) protocol to share a desktop remotely, so any iOS app that supports VNC will work. There are quite a few of these, in fact, but one

of the best is VNC Viewer. It can be found in the App Store (£7.99, [tinyurl.com/pxe64rz](http://tinyurl.com/pxe64rz)), but before using it you'll need to configure the Mac you want to connect to. Put a tick alongside Screen Sharing in the Sharing component of System Preferences, then click the Computer Settings button and ensure that there's not a tick alongside either of the two headings you see.

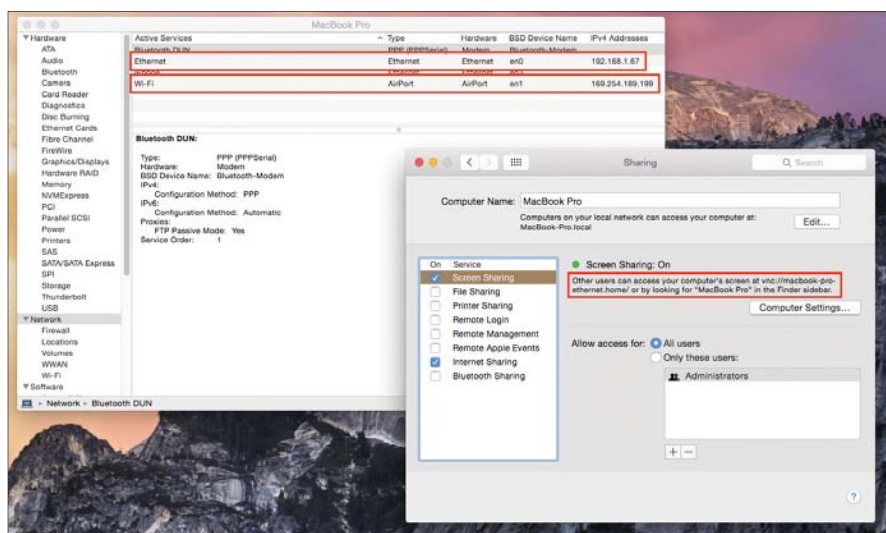
Note the address listed beneath the heading that reads 'Screen Sharing: On'. You'll need it to connect in a moment. It's also a good idea to note your Mac's IP address just in case using this address doesn't work – click the Apple menu, hold down Alt and click System Information. In the window that appears,

click the Network heading in the list at the left, and look alongside either Wi-Fi or ethernet at the right depending on which your Mac is using.

## Connecting to your Mac or PC from an iPad or iPhone

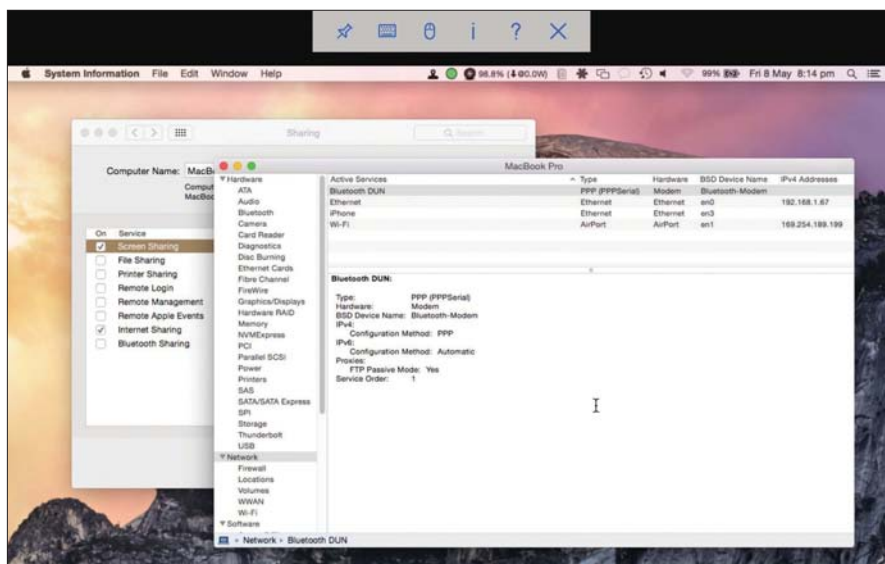
On the iOS device, open the VNC Viewer app and click the '+' icon at the top right. In the dialog box that appears, type the address you discovered in the paragraph above, and in the name field type something memorable and identifiable, such as Mac Desktop.

Click Done and then the Connect button. You'll be warned that you're using an unencrypted connection. This is unfortunate but there's no way to avoid it,



On the Mac you'll need to note either your computer's name or its IP address, as highlighted here.





Using the free VNC Viewer app you can remotely control your Mac's desktop.

and it's limited to the Ultimate, Business and Professional editions of XP, 7 and 8. (Although there are hacks to make it work on other versions – just Google.)

Before using Remote Desktop, you'll need to ensure it's activated on the Windows computer you want to access. This can be done by clicking Start and typing **Allow Remote Access To Your Computer**. Next, click the entry that appears in the results, and click Allow Connections Only From Computers Running Remote Desktop with Network Level Authentication (More Secure). Then click OK.

You'll also need to know the IP address of the Windows computer. Click Start, then type **cmd**. In the DOS box that appears, type **ipconfigw** and hit Enter. In the output, look for the line that reads IPv4 Address and make a note. Then close the DOS box. Start the Microsoft Remote Desktop app on your iOS device and click the '+' button in the top right, then select Add PC or Server. In the PC Name field, type the IP address you noted earlier. Tap the User Name field, then tap Add User Account. Now type the username and password of the Windows computer you want to access, and tap Save, and then Save in the parent dialog box. Then tap the icon for your new connection. You'll be asked immediately if you want to accept the security certificate. Tap the switch alongside Don't Ask Me Again and then tap Accept.

You'll see the remote PC's desktop and your fingertip moves the mouse cursor. To switch to touch controls, as if using a touchscreen PC, tap the IP address toolbar at the top of the screen, and select the option at the bottom right on the sidebars that appear. To bring up a keyboard for typing, tap the keyboard icon in the toolbar at the top of the screen.

To disconnect, tap the toolbar and then tap the 'X' at the left of the thumbnail listing at the left of the screen.

**Connecting to a remote Windows desktop** can be done using the free Microsoft Remote Desktop app.

so tap the Connect link at the top right of the window. You'll then be prompted for the username and password of the Mac account you want to log into. You should type the 'short' version of your username – usually your first name, or the first word of the longer version of the username.

You'll connect immediately and see a tips panel showing some control tricks. However, in short, the mouse cursor is represented by a small dot and you 'shove' it around – push up on the screen, for example, and wherever the mouse cursor happens to be, it will also move up. It can take a bit of getting used to. Tapping on the screen is the equivalent of clicking. Use the pinch-expand gesture to zoom in and out of the desktop.

To make a keyboard appear for typing, tap the keyboard icon on the

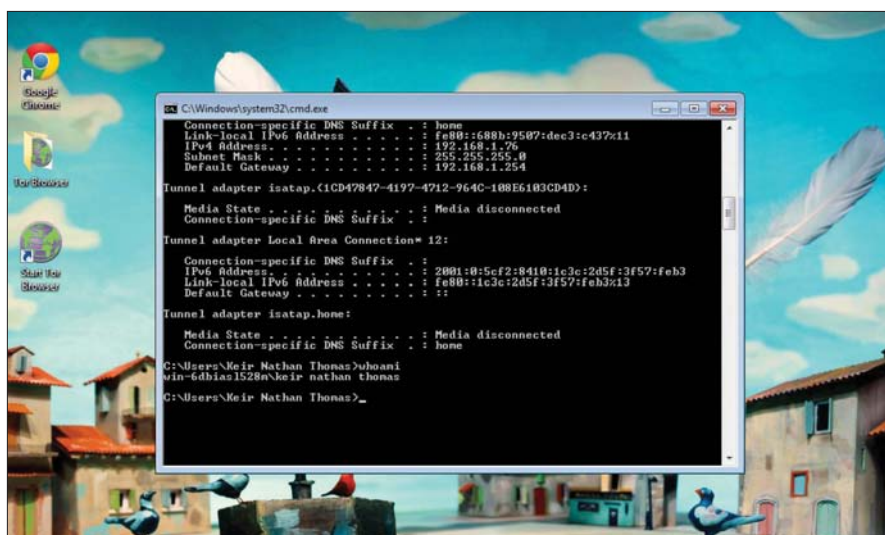
toolbar at the top of the screen. To disconnect from the remote Mac, tap the 'X' icon on the toolbar.

If you want to connect to a Linux desktop, you can install a VNC server package (just check your distro's package archive), and the same VNC Viewer app can be used to connect as described above.

### Connect to remote Windows PCs via your iPad or iPhone

Microsoft has a surprising number of apps available for iOS and one of them is Microsoft Remote Desktop. This lets you remotely connect to the desktop of Windows computers. You'll find it in the App Store (free, [tinyurl.com/puw2jez](http://tinyurl.com/puw2jez)).

Not all versions of Windows have Remote Desktop compatibility built in,



# The Adjust tools in Photos for OS X

HOW TO USE THE ADJUST TOOLS IN PHOTOS FOR OS X

By Glenn Fleishman

**M**any years ago, I was in an office full of people who used desktop-publishing software, and the running joke was how they needed a 'Make Better' button. Very amusing, until software such as Apple's iOS Photos app added an Enhance button that often just made things better. Using a reasonably sophisticated analysis of an image, a single click could reshape an image's tones to make it an objectively more fuller-toned version of itself.

But 'better' is often not good enough, and if you're willing to roll up your sleeves, the Photos for OS X app includes more refined, granular and easier-to-use tools than iPhoto. They're also speedy to preview and apply in comparison.

(If you have iCloud Photo Library enabled, any edits you make are synced to your other Photos libraries, including in iOS. On the Mac, the original version and applied edits are synced, so you can revise changes. In iOS, the original and a changed version are synced, but you can't modify the adjustments.)

## Getting started

The reason why you are editing a photo is because you are trying to fix a problem. These include:

**The Edit view** in Photos provides access to adjustment tools.

**White balance:** The image has the wrong colour cast.

**Noisiness or blurriness:** The image was taken in low light and is full of noise or lacks sharp definition.

**Overall muddiness:** Tones lumped in the middle without good differentiation.

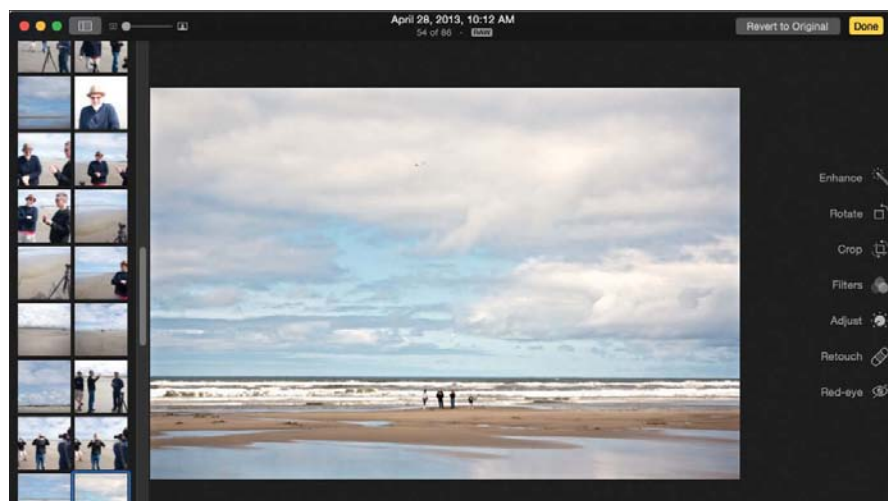
**The edges of the tonal range:** The highlights (lightest areas) appear blown out or fully white with no range. Or the shadow detail (darkest areas) is too black, making it hard to distinguish what's depicted.

Photos offers a range of tools that help with each of these problems. Double-click any image in the app until it's shown at full size, and then click the Edit button at the upper-right of Photos window.

(When you are using iCloud Photo Library and have the preference set to optimise, if this image isn't stored at full resolution on your Mac, Photos will download it for editing.)

**TIP:** To get the best results when editing, shoot in RAW mode on your camera. RAW isn't a single format, but a way for cameras to store unadjusted photo data that contains more information than a JPEG or other format that is available in the camera's software. This preserves more tonal information. Every camera that supports RAW has a different way of enabling it, and the files are much larger than an equivalent JPEG, so consult your manual.

The Edit view changes the white background to dark and adds a row of





editing options at the right: Enhance, Rotate, Crop, Filters, Adjust, and Retouch. A red-eye control appears when Photos thinks you're working on faces, but you can force it to always show up via the View menu.

When you click Adjust, you'll see a subset of all the available controls. Click the blue Add button (see right) at the top, and select to show or hide any control one at a time. When you've worked out the right combination, choose *Add → Save as Default*, and that will be your automatically displayed adjustment set. My default set, for example, includes everything but Vignette and Black & White, which I don't routinely use but can show if needed.

Note that whenever you select an item from the list, Photos will apply it. So if, for example, you select Vignette, you will see a softly feathered edge haloing your entire image. Click the blue checkmark next to the Vignette item to disable it.

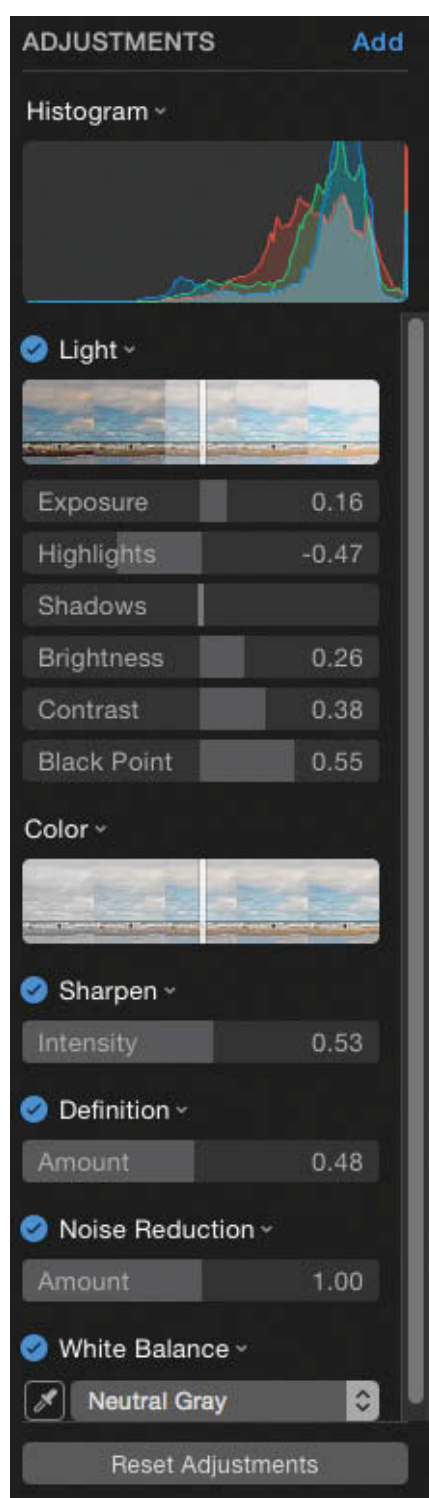
Each item will initially appear in its 'collapsed' form, with a slider showing a numeric display or an array of image variations, except for White Balance and Levels. Hover over an item, and you'll see an Auto button appear. Click this, and Photos will apply its best algorithmic adjustment.

Each adjustment – except Definition, Noise Reduction and Levels – also hides more detail. Hover near the adjustment's name, and you'll see a downward-pointing expansion arrow. Click it, and more detailed settings will appear.

## Making adjustments

For most images of landscapes and people, the goal of image adjustment is to either bring something closer to reality. This can be achieved by matching tonal range, colour and clarity to what you saw; to enhance it and bring out details that might have been underemphasised in person; or to stylise the image data to bring out an aspect or set a mood.

You might associate adjustments only with the first two items in that list, and think of using Effects to achieve the last. But while some effects use an algorithm or mask to apply a treatment, others are a set of adjustments applied together.



**Photos' Adjust pane** allows you to modify an image's tonal range.

Let's start with the first two cases, in which an image remains realistic. The goal is not have an even tonality, from white through highlights, midtones, and shadows to black. Rather, you want a distribution that allows detail to be seen throughout without making it unnatural. (High dynamic range or HDR images often look supernatural because they are able to preserve so much tonal variation across the entire range.)

Light is the single most important correction you can make, and it's often paired with Sharpen, Definition, and Noise Reduction to produce a more balanced and crisp image. White Balance is often less important, because the automatic white balance in many cameras provides the best match. The Auto option in Photos seems to handle cases that don't, such as when a photo is shot with indoor lighting but a camera is set to sunlight conditions.

Drag the slider back and forth on the main Light visualisation and you'll see, sometimes with a short lag, how several aspects of the image change at once. When you click the expand arrow to the right of its label, you'll see six separate sliders: Exposure, Highlights, Shadows, Brightness, Contrast and Black Point.

Dragging the main Light slider changes each of those settings according to an algorithm that rebalances tones. You can view these changes, too, in the Histogram display at top, which shows the distribution of colour (as red, green and blue) and the overall tonal range (as grey) from darkest at left to lightest at right. The histogram shows the percentage of colour at each tonal value on the scale.

Most photos are either too light or too dark, but Brightness and Exposure by themselves can't solve that. Both are coarse tools: Exposure moves all the tones in an image towards the brightest point or white; while Brightness largely makes the darkest tones lighter. Both controls can blow out the lightest parts of a photo, eliminating detail. It's best to use Exposure rather than Brightness, and to use a light hand, moving it up just slightly.

Contrast is a linear adjustment, increasing or reducing the distribution of tones in the middle. Move Contrast lower,



and tones spread out, becoming muddy; higher, and they move to either end, becoming stark.

It's often the case that if you need to increase the Exposure, you back off on Highlights, as the Exposure has already pushed up the lightest values. Going below the zero point on Highlights brings some detail and range back. Likewise, the Shadows slider can be bumped above zero to pull out detail hidden in darkness. Too far, however, and camera noise, which is prevalent in the darkest areas, starts to show up, as well unwanted detail.

The Black Point lets you set a cutoff point for the blackest part of an image. Move the control to the left, and midtones become greyer; move it right, and midtones transform into black more and more.

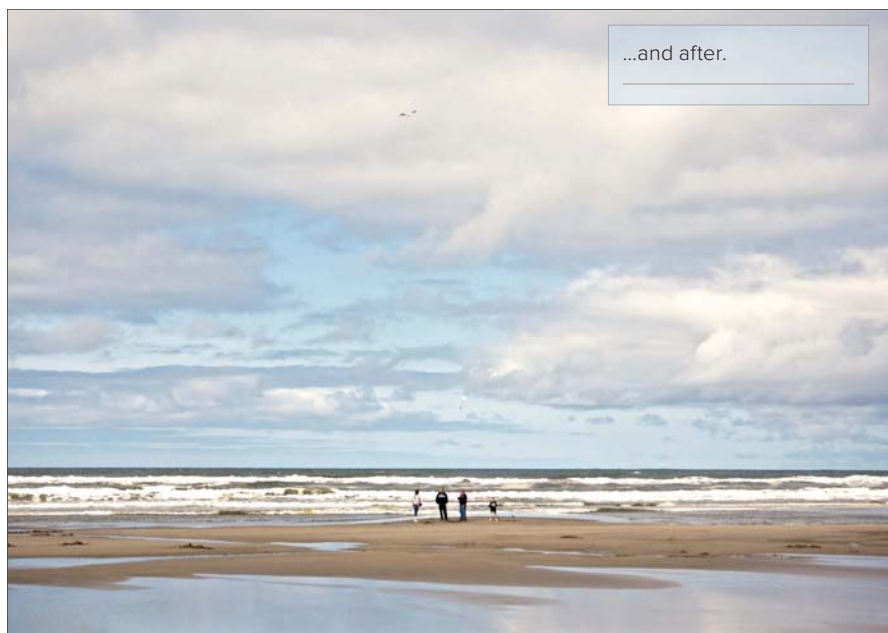
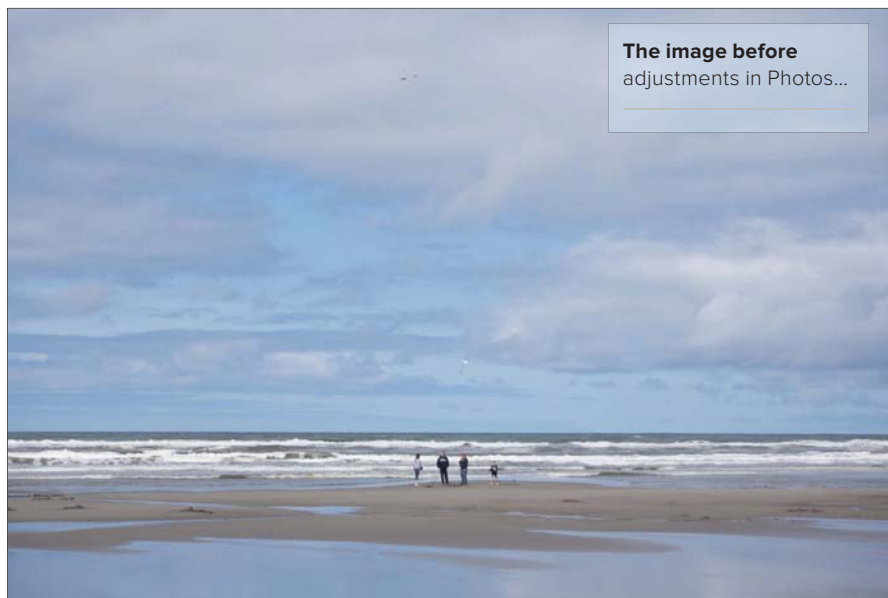
The Sharpen, Definition and Noise Reduction commands work as a set. Sharpening increases the contrast between adjacent pixels that are already some tonal value different, like turning a shallow drop-off into a cliff. Definition reduces muddiness or the sense of 'haze' across the entire image. Noise Reduction smooths patterns that are typically artifacts of the limits of camera sensors – adjacent pixels that are radically different in colour or tone.

Most images benefit from some sharpening, because our eyes are terrific at recognising edges between distinct tones; emphasising this makes an image seem more 'real'. Hazy images can do with an increase in definition as well, but it typically works best with nature rather than people or objects, where too much definition makes a subject look unnatural, ironically. Reducing noise in any image in which you can see speckling in the dark or light areas will reduce its artificiality as well, but too much can introduce an uncanny valley of smoothness.

**One final tip:** When you've found an optimum adjustment for one photo and

.....

**Noise Reduction smooths patterns that are artifacts of the limits of camera sensors – adjacent pixels that are radically different in colour or tone**



you want to fix similar ones, you can choose *Image → Copy Adjustments* on the modified picture (⌘-Shift-C), and then on any other photo, select *Image → Paste Adjustments* or press ⌘-Shift-V.

### Rewarding

Photos rewards experimentation in a way that iPhoto didn't. iPhoto had some of these controls, but not all, and they

didn't provide the same feedback and interaction. In just a few weeks of using Photos, I'm making much more effective adjustments in Photos, although Adobe Lightroom remains the gold standard for fine-grained control.

If you find you've made an error, Photos has a very deep level of Undo, although I couldn't find the bottom, if there is one. Every adjustment you make is also reversible through sliders, or by clicking a Reset Adjustments button to revert to the original. Even clicking Done doesn't doom you to changes: you can always click Edit again and reverse or change any manipulations.



# HOW TO FORMAT A STARTUP DRIVE FOR A MAC



WE WALK YOU THROUGH THE PROCESS OF CREATING A STARTUP DRIVE

By Roman Loyola

**S**ometimes you want to wipe out all the data that's on a hard drive or solid-state drive – erase it and start over. The best way to do this is to format the drive, which both erases the drive and prepares it for storing data by mapping out bad sectors,

creating address tables for locating the data on the disk, and more. Similarly, you may have purchased a new drive that was formatted for Windows out of the box. You'll want to reformat it for your Mac.

But formatting a drive so that it can be used as your Mac's startup drive

requires a slightly different procedure than formatting it for use as a secondary drive for storing data.

Over the following pages, we show you the steps using OS X 10.10 Yosemite, though the process is the same if you're using Mavericks or Mountain Lion.



## STEP 1: Make a connection

To format an external storage device, connect it to one of the ports on your Mac. Turn the drive on, and make sure it appears in the Finder. If the drive is internal, it should already show up in the Finder. If not (for example, if you installed a new drive that hasn't yet been formatted), look for it in Disk Utility in the next couple steps.

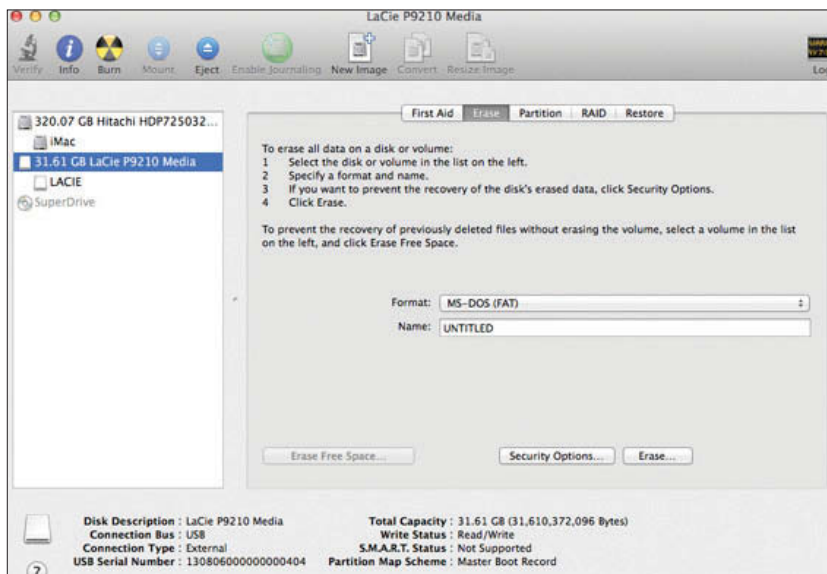


## STEP 2: Open Disk Utility

You'll use OS X's Disk Utility app to format the drive. Locate Disk Utility in *Applications* → *Utilities* and open it.

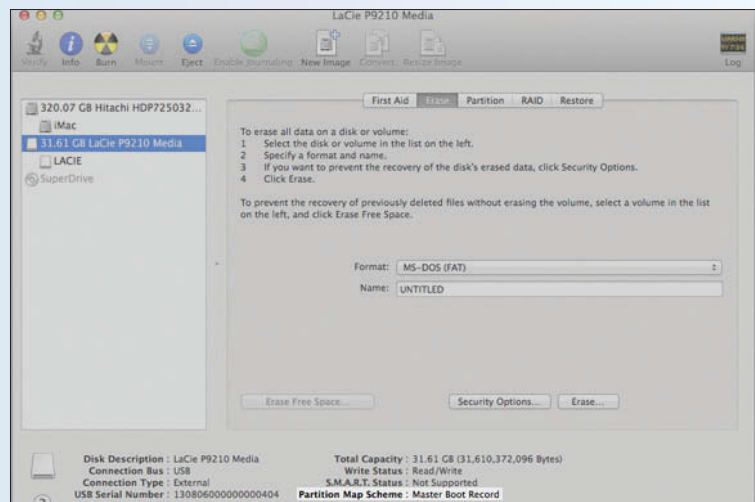
## STEP 3: Select the drive in Disk Utility

Disk Utility's left pane shows the storage devices connected to your Mac. Underneath each device are the drive's partitions. Select the drive you want to format. (Chances are, you want to format the whole drive, so you should select the drive itself, not any of its partitions.)



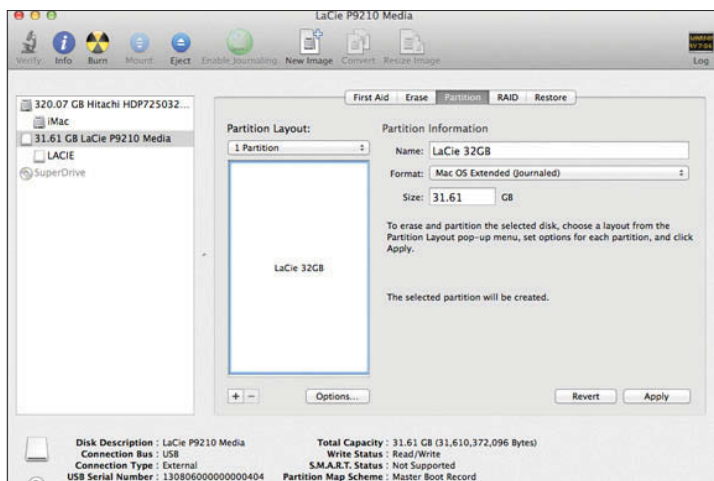
## STEP 4: Check the partition map

Click the Erase tab if it's not already selected. At the bottom of the window, you'll see some information about the drive you have selected. Look at the Partition Map Scheme entry. If it says GUID Partition Table, you can format the drive by selecting Mac OS X Extended (Journaled) in the Format pop-up menu, giving the drive a name, and then clicking Erase. (Remember: This erases everything on the drive.) You can now skip directly to Step 8. If the Partition Map Scheme says Master Boot Record or Apple Partition Map, you need to continue to Step 5.

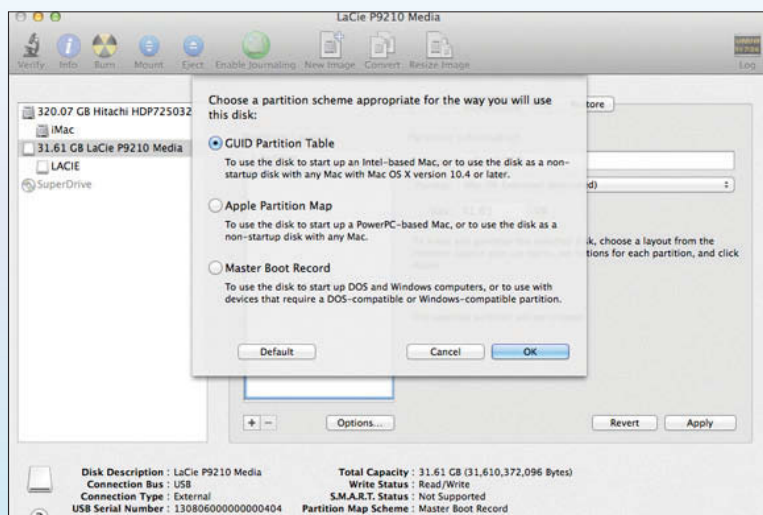


## Step 5: Configure the partitions

Click the Partition tab if it's not already selected. In the Partition screen, click the Partition Layout pop-up menu and select the number of partitions you want. (In this tutorial, we're configuring the drive with one partition, the most-common scenario.) Under Partition Information, enter a name for the partition – with a single partition, this is simply the name of the drive. In the Format pop-up menu, choose Mac OS Extended (Journaled).





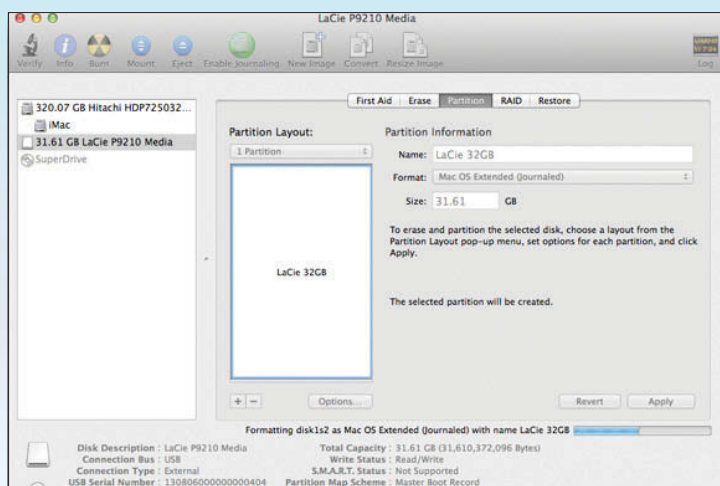
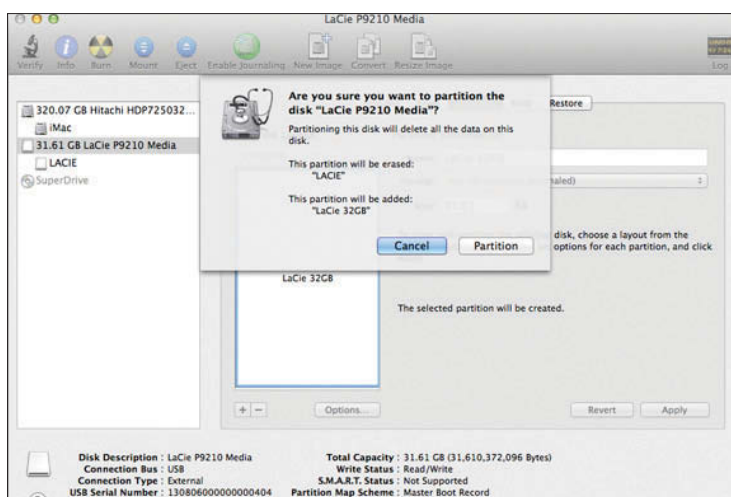


### Step 6: Choose the correct partition scheme

Still in the Partition screen, look at the graphical partition display in the middle of the window. Select the partition you just configured, and then click the Options button. In the sheet that appears, select GUID Partition Table and click OK. This step ensures your drive can be used to boot a Mac.

### STEP 7: Complete the partition process

Give your settings one last look. And remember: When Disk Utility formats the drive, it erases all the data that's on the drive. If you're sure that's OK, click Apply. You get one last warning to confirm that you really want to format the drive. If so, click Partition.



### Step 8: Wait, and done

It takes a few minutes for Disk Utility to do its thing. When it's done, your newly formatted drive will appear in the Finder, ready for an OS X installation (or for restoring OS X and your data from another drive).

# Reviews

Free

Contact

■ [apple.com/uk](http://apple.com/uk)

Specifications

64-bit CPU; 8GB drive space

**Macworld**  
PREVIEW

## Apple OS X El Capitan

Apple's primary focus with OS X El Capitan is performance and stability, and the tech giant is claiming that older Macs will see significant improvements.

If that sounds boring, you'll be glad to hear there are still a few new features as well as some much-needed updates to the accompanying software and the user interface.

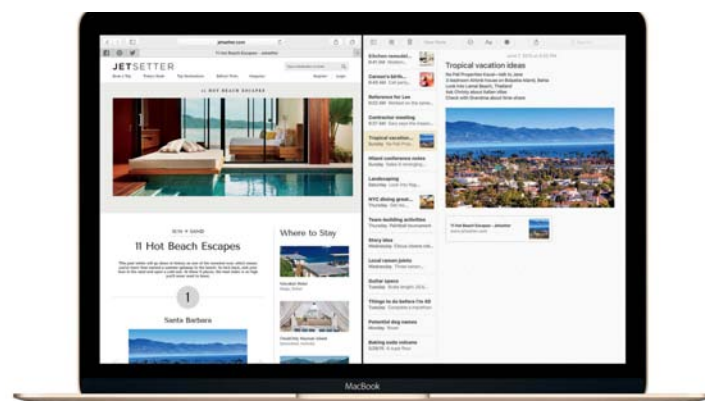
For example, you'll be able to choose to hide not only the Dock but also the Menu bar at the top of the screen. Also, when you enter Mission Control (usually by pressing F3) you'll be able to see all the documents you have open. If this sounds familiar that's because Apple previously offered this feature in earlier versions of OS X - it was called Exposé. In Yosemite, documents associated with apps are gathered together, overlapping each other, so it's harder to select the Word document you wish to edit.

There's also a new full-screen mode called Split View that lets you have more than one app open at once. To activate it, click and drag the green window-resize button to fill the screen with two apps at once.

Also getting a significant change is Spotlight, Apple's search tool on the Mac. One of the main criticisms levelled at this feature in Yosemite is that Apple moved it to the centre of the screen from the right-hand corner. This gave Spotlight more space for its results, but people were frustrated that the window couldn't be moved from its new location. That's set to change in El Capitan - you will be able to click on the result box and move it around the screen.

Spotlight is also getting 'natural language' search - which hints that Siri may be coming to the Mac. You'll be able to construct your search query in a more colloquial way, for example: "documents I wrote in July" or "emails sent by Ashleigh".

Photos for Mac hasn't been out for long, but El Capitan will bring some much-needed updates, including the return of geotagging (which was present in iPhoto but



missing from the first version of Photos). It will also be possible to sort albums by date and title. Apple also says that the software will be better at identifying Faces.

Safari is getting a few tweaks, too. We like the fact that we can 'Pin' our favourite sites to the menu bar, although it strikes us that we will have too many ways to store our favourites: Pins, Top Sites, and Favourites. Apple really needs to do away with Top Sites because it is in essence the same as Favourites.

Another new Safari feature is that it will identify which of your open tabs is playing audio and make it possible to mute the sound with a single click on that tab. If you have more than one audio stream open, you can click on the speaker icon in the address bar to see a list of all the tabs playing audio. You'll be able to shut down the audio on the tabs you wish from this view.

While both of these new Safari features are impressive, they have featured in Chrome for some time.

We are glad to see that Apple is giving Notes some attention in El Capitan. The program will be able to handle photos and PDFs, URLs and map locations, as well as text. Other new features include a formatting option and an attachments browser, which you can flick through to find all the media, websites and other attachments you have added to the app from any of your devices.

Mail is also gaining some new features that are reminiscent of the iOS Mail app. There are two new gestures that will be familiar to any iOS users: swiping left to

delete an email, and swiping right to mark as unread. You'll also be able to minimise an email you are composing, just as you can in iOS.

New to El Capitan is the ability to manage different email threads in Safari-like tabs. The new 'natural language' search also shows up in Mail, making searching for "emails from Ashleigh with photos attached" easier than ever.

One significant new feature coming to El Capitan is Metal, the graphics technology that was announced with iOS 8. According to Apple, it will bring improved game and processor performance. Adobe has already committed to adopting the technology for its OS X apps and demonstrated how Metal has improved After Effects and Illustrator. Autodesk and The Foundry have also committed to using Metal.

Metal for OS X is also great news if you're a Mac gamer. Major game developers have already confirmed their commitment to Metal, including Unity and Blizzard, as well as Feral and Aspyr who specialise in bringing Windows games to the Mac. Along with the performance enhancements coming in El Capitan, we expect Metal to have a real impact on this sort of processor intensive work.

### Macworld's buying advice

With El Capitan, Apple has concentrated on improving performance. There are, however, enough new features and updates to the accompanying software to keep Apple fans happy. **Karen Haslam**

Free

Contact

■ [apple.com/uk](http://apple.com/uk)

Specifications

1.3GB drive space

**Macworld**  
PREVIEW

# iOS 9

OS 9, the next version of Apple's software operating system for iPad, iPhone and iPod touch, was unveiled at WWDC 2015. Here, we look at what you can expect.

The flagship feature is a contextually intelligent, predictive personal assistant that Apple has referred to as 'Proactive'. It tries to work out what you want to do before you ask, and then offers a shortcut to that function.

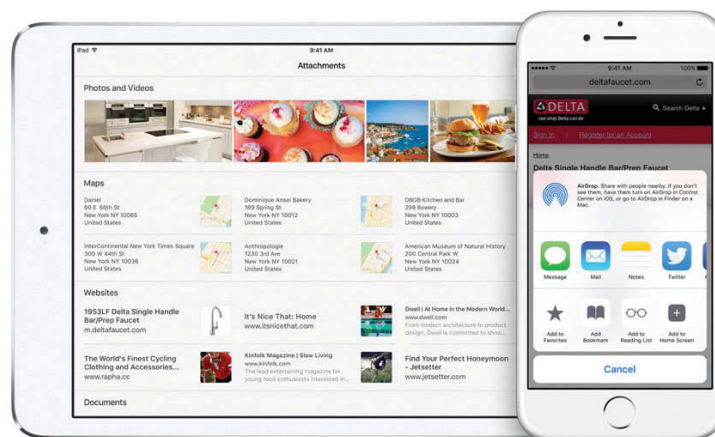
Proactive constantly observes what you do on your device: the apps you use, the people you contact, and when and (we understand) where you do these things. It learns your habits. So, for example, if you always open the Weather app first thing in the morning, Proactive will notice the pattern and start to add that app's icon to the list of quick-access shortcuts on the Search screen (accessed by swiping left from the Home screen, or down from the top).

Some apps will also be added to the lock screen when Proactive is convinced that you're about to use them (such as the Camera app icon, the app icon will appear in grey at the bottom of the lock screen).

The Holy Grail of iOS features on the iPad, and one we've all been demanding for years is app multitasking. At its most basic, this lets you view two apps at once, side by side. One occupies about a third of the screen, sliced vertically off the right-hand side. This is called Slide Over, and is activated by swiping inwards from the right-hand side of the screen, triggering a menu sidebar that offers a range of apps. You then swipe down from the top of that sidebar to go back to the app chooser pane, or tap the 'main' app to leave the Slide Over view.

In Slide Over, however, you can't interact with both apps at once. To do so you'll need an iPad Air 2. With Split View, you can interact with them at the same time, even scrolling them in opposite directions. The amount of space each app takes up is also adjustable, between 50/50 and two thirds/one third.

The last stop on our tour of multitasking in iOS 9 is picture-



in-picture video viewing, and for this one, thankfully, we're back to compatibility with all iOS 9 iPads. It's simple but highly appealing: if you're watching video (online, in YouTube or another video app, or in FaceTime) you can tap the Home button and you'll be taken back to the Home screen - yet the video will shrink down and carry on playing. It's a lovely touch, and adds to the sense of the iPad as a proper desktop, a device that you can use to get things done.

Another new feature announced at WWDC is News. This is a bit like Flipboard, in the sense that you set it up by selecting various sources, and it then draws in news stories from those sources automatically. More than this, News appears to be able to learn about your interests: it will show you articles from sources you didn't select if they match your interests, and there's an Explore feature that shows you new channels that the app thinks you might like, plus more topics.

Content can include photos and galleries, audio, video, maps and animations. You can bookmark stuff for later, there are embedded videos, and you can search through the app's more than a million topics.

Before iOS 9's launch, we reported that Apple seemed to be plotting major changes to Maps, and sure enough, it now offers public-transport directions. This is a vital update, but be warned that for the time being Maps's public-transport coverage is severely limited. Macworld is based in London, so we've been happily testing iOS 9's ability to guide us around the buses and Tube. But that's it as far as British cities go: fans of the

Manchester tram system or the Glasgow Metro are out of luck - at least for now.

Finally, and in joyous anticipation of the exciting Apple Pay UK launch in July, Maps also gains the ability to tell you whether nearby shops support Apple's mobile payment system (see page 80 for details).

Next up is Notes, that most neglected and basic of preinstalled productivity apps - yet, thanks to the updates in iOS 9, Apple may yet convince you to use Notes for more than just shopping lists.

Mind you, even for shopping lists, Notes is better than ever, thanks to the ability to easily create to-do lists. There's a range of shortcut buttons either side of the QuickType suggestions on the iOS system keyboard; one of these is a little tick in a circle. Highlight a selection of text in Notes, tap that icon, and it will be reformatted into a to-do list, with a tickable spot on each item.

The last item on our list of new features concerns battery life. iOS 9, Apple says, is more streamlined and power-efficient than iOS 8 - so much in fact that an iPhone 6 running iOS 9 will have an extra hour of battery life.

If you want to extend your battery life still further, you can trigger a new Lower Power Mode, which Apple claims is good for an extra three hours away from the plug. It also makes the battery indicator turn orange.

## Macworld's buying advice

iOS 9 has lots of appealing new features, together with much-appreciated tweaks to the interface and, in particular, the system keyboard. **David Price**



From £1,599

inc VAT

## Contact

■ [apple.com/uk](http://apple.com/uk)

## Specifications

15.4in (2880x1800) Retina display with IPS technology; 2.2GHz quad-core Intel Core i7 processor (Turbo Boost up to 3.4GHz); 16GB of 1600MHz DDR3L onboard memory; 256GB PCIe-based flash storage (configurable to 512GB or 1TB flash storage); Intel Iris Pro Graphics; 720p FaceTime HD camera; MagSafe 2; 2x Thunderbolt 2; 2x USB 3; HDMI; headphone socket; SDXC card slot; 802.11ac Wi-Fi wireless networking; IEEE 802.11a/b/g/n compatible; Bluetooth 4; 358.9x247.1x18mm; 2.04kg

Macworld



EDITORS' CHOICE

# Apple MacBook Pro with Retina display (15in, 2.2GHz, mid-2015)



**T**wo models of 15in MacBook Pro with Retina display have been in production since the Apple's best notebook launched in late 2012. Both these models were again refreshed in June 2015, with important updates made to the trackpad and the flash-storage specification.

With Intel's Haswell series of processors now almost two years old, there was great expectation that the mid-2015 updates to the 15in Retina MacBook Pro would introduce the quad-core mobile

version of the next CPU generation – codename: Broadwell.

But that was not to be, and so both of the new 15in models carry the selfsame Intel Core i7 main processors as the Retina MacBook Pro series that was launched in July of last year. In the case of the entry-level version at £1,599 we review here, that means an Intel Core i7-4770HQ with baseline clock frequency of 2.2GHz.

This processor has four real processor cores, each able to juggle two processing threads, thus replicating the effect of an eight-core chip. In addition, its Intel Turbo Boost 2.0 technology allows at least one core to temporarily and dynamically overclock to 3.4GHz providing temperature and current conditions allow.

Packed inside the Intel processor is this MacBook Pro's graphics processor, designated by Intel as Iris Pro Graphics 5200. When we first met this integrated graphics processing unit (iGPU) in the late-2013 model MacBook Pro series, we were surprised to find how close in performance it could come to the dedicated nVidia graphics.

As we saw with last summer's refresh, the memory configuration is now 'maxed out' at 16GB of low-power DDR3 RAM, running at the Haswell chip's memory clock speed of 1600MHz. In reality, the Intel chip can field up to 32GB of memory, but Apple has set the ceiling at 16GB, and since it's soldered to the logic board there's no scope for memory upgrades now or later.

The new 2.2GHz MacBook Pro also benefits from the latest Force Touch trackpad, with customisation options that allow you to set the primary click pressure as Light, Medium or Firm (Medium by default), and the secondary Force Click with haptic feedback that can be used in the OS X Finder for Quick Look of files and folders as well as provide variable speed media controls with QuickTime Player. This variable-speed function hasn't been ported to iTunes yet, but we anticipate seeing it available for more apps in the future.

With the same 2.2GHz processor as mid-2014's 15 Retina MacBook Pro, we would expect the core processor and graphics speed to be the same as that model.





In our tests this was confirmed, with benchmark results effectively the same. To recap, that means a Geekbench 3 result here of 3428 points, and 13,315 points in multi-core model.

Cinebench 15 scored this MacBook with 121 points single-core and 592 points multi-core, and the OpenGL graphics rendering test returned a framerate of 31fps. This means the gap between integrated and discrete graphics models of the 2015 MacBook Pro has widened a little – the previous nVidia version recorded 53fps, while the AMD-powered model averaged 63fps.

We saw the same story across our gaming graphics test – Batman: Arkham City averaged a decent 69fps at 1280x800 pixels and High detail, or 61fps when set at the most appropriate resolution of 1440x900.

Turning to Tomb Raider (2013), we found again that the MacBook Pro with integrated graphics was more than up for the job – providing you adjust the game's settings to use Legacy OpenGL. At the starting point of 1280x800 and Normal detail, this meant an average framerate 46fps. Without the latter tweak, expect to see less than half that frame rate (we recorded just 21fps). Set to 1440x900 and High detail with Legacy OpenGL, this MacBook Pro was happy to return an average of 39fps, with a minimum dip to 29fps, making this our preferred optimum for this game/notebook combination.

There may no change in application or graphics performance

with this new 2015 model, but real-world use should show it to be a much faster computer, thanks to the major uplift in storage performance.

We have been astonished by the speed increases available since Apple started rolling out PCIe-attached flash drives in 2013. Now even this entry-level 15in laptop sees the benefit of an upgrade from two lanes of PCIe 2.0, to four lanes of PCIe 3.0. Best sequential speeds of the former drive were around 785MB/s for sequential reads and 730MB/s for sequential writes. This mid-2015 MacBook Pro can now comfortably reach 2000MB/s in reads at least; although the smaller 256GB capacity drive takes a small toll on peak write speeds.

We measured an average of 1221MB/s for sequential writes, just a small way behind the 1542MB/s we saw with the 512GB flash drive in the top 2.5GHz model. The delta increase in storage speed is also highly evident at the all-important small-file level: in our tests, random 4kB writes moved from 58MB/s to 111MB/s. And random 4kB reads from 22- to 37MB/s.

These latter results suggest that operations that demand fast IO for small data files – such as application launches – will feel even faster; even if any Retina MacBook Pro user is unlikely to complain about any current lag. But these are all creditable steps to making your computer respond instantaneously to your touch and control.

We gave the ultra-high resolution IPS display a test of its key

parameters, and found it to be of the same specification as that in the AMD MacBook Pro model we tested last month. This one showed a colour gamut of 97 percent of sRGB, and 72 percent Adobe RGB.

Contrast ratio exceeded 700:1, up to 750:1 at peak brightness (277cd/m<sup>2</sup>), while colour accuracy was superb, with an average Delta E well below 1, at 0.69.

Apple is suggesting an extra hour of battery life in this update, which is broadly what we found in the AMD version of the 2015 MacBook Pro, which lasted two minutes shy of nine hours. In our standard video rundown test for this Intel-graphics version, we recorded eight hours 32 minutes, which we found a little surprising since its CPU is clocked 300MHz lower.

So we ran the test overnight again, and this time saw eight hours 31 minutes. Which speaks well for consistency of the test procedure, but not so well for longevity that we expected to exceed its more powerful counterpart.

### Macworld's buying advice

Now we have an option on a faster AMD graphics, the gap between the two available 15in MacBook Pros has widened a little, although even the integrated Iris Pro graphics in this model are capable of some accomplished gameplay at decent quality settings. Incredibly quick storage and the latest man-machine trackpad interface all contribute to a useful update on a now classic design. **Andrew Harrison**

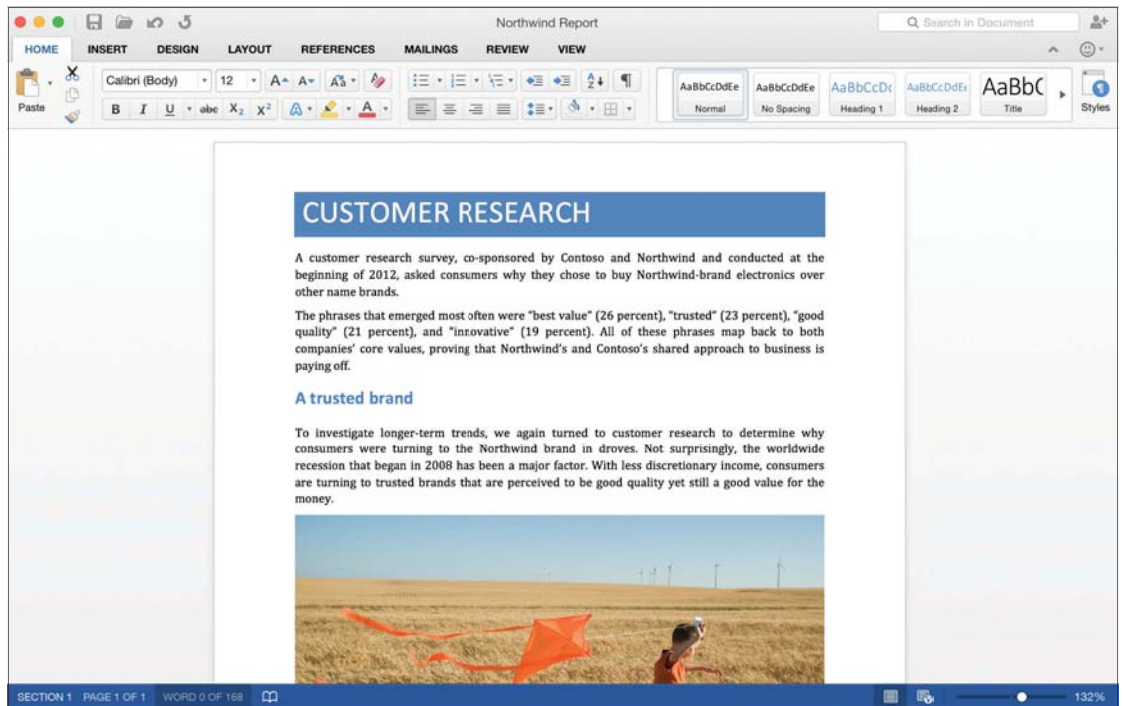
# £TBC

Contact  
[microsoft.com/en-gb](http://microsoft.com/en-gb)

## Specifications

OS X 10.10 or later

# Microsoft Word for Mac 2016



One of the big boasts of the new Office for Mac is cloud collaboration and Word perhaps benefits most. Provided you're working from OneDrive or a SharePoint server (the option to connect to these appears in the File Open dialog box of all the new Office apps), somebody else can open the same file and edit/work alongside you. They might do so using the iOS version of Word, for example, or online at the Office website.

This isn't as seamless as Google Docs, where you can actually see the other person's cursor and what they're typing, because their changes appear only when they save the document (which is one reason why Word on iOS automatically saves by default). However, it does work well otherwise, and Microsoft's put in place some nifty conflict resolution that avoids a document getting jammed by people editing the same data – a problem that blights the iWork apps and iCloud. If two or more people work on the same sentence or paragraph and then save their changes, both edits will be recorded and then flagged-up for somebody to fix. This works within the framework of a new inline commenting system that's also a boon to collaborative working.

The cluttered and frankly useless ribbon design of the older Word has been massively overhauled throughout the Office apps and in Word are consolidated into more logical selections, with the Design ribbon in particular providing quick access to ready-made formatting, colour schemes and matching font choices.

As with the other new Office apps, the Inspector/Toolbox has gone from Word and its features spread either over the new ribbon design, or a sidebar that appears at the right of the window when needed. For example, arguably one of the most useful features of the Inspector was quickly applying and modifying text styles. Well, now you need only click the Styles Pane icon on the Home ribbon and a virtually identical listing appears in a pane at the right of the window. Click and drag the header of this and it can be 'torn away' like a browser tab, thereby creating a floating window that's always on top. We couldn't figure out how to reintegrate this with the main window, however, other than closing it and clicking the ribbon button again.

The Navigation Pane at the left of the window has been redesigned and can be accessed via the View ribbon. As with the

older version of Word, this provides quick access to a thumbnail view of pages, as well as the document map and any tracked changes.

Find and Replace also finds a new home there, although as with the older version of Word, we find ourselves wishing there was a more accessible Replace tool that didn't require so much effort to use.

On the whole, Word's new interface looks a lot cleaner and significantly less cluttered. However, if you've avoided the ribbon in the older Word, and you probably did, then it can still be confusing finding where things have gone. Those thinking of making the brave leap to this beta software should be aware that the help file doesn't yet exist, so you're pretty much on your own glaring at the screen until what you want reveals itself.

## Macworld's buying advice

After using Word for just a few hours, it seemed like the old version was antediluvian. In fact, it felt similar to the switch from the old skeuomorphic design of OS X Mavericks compared to Yosemite. Although there aren't many new features to write home about, the new version of Word simply feels fresher and much more streamlined in everyday use. **Karl Hodge**

**Macworld**  
 PREVIEW

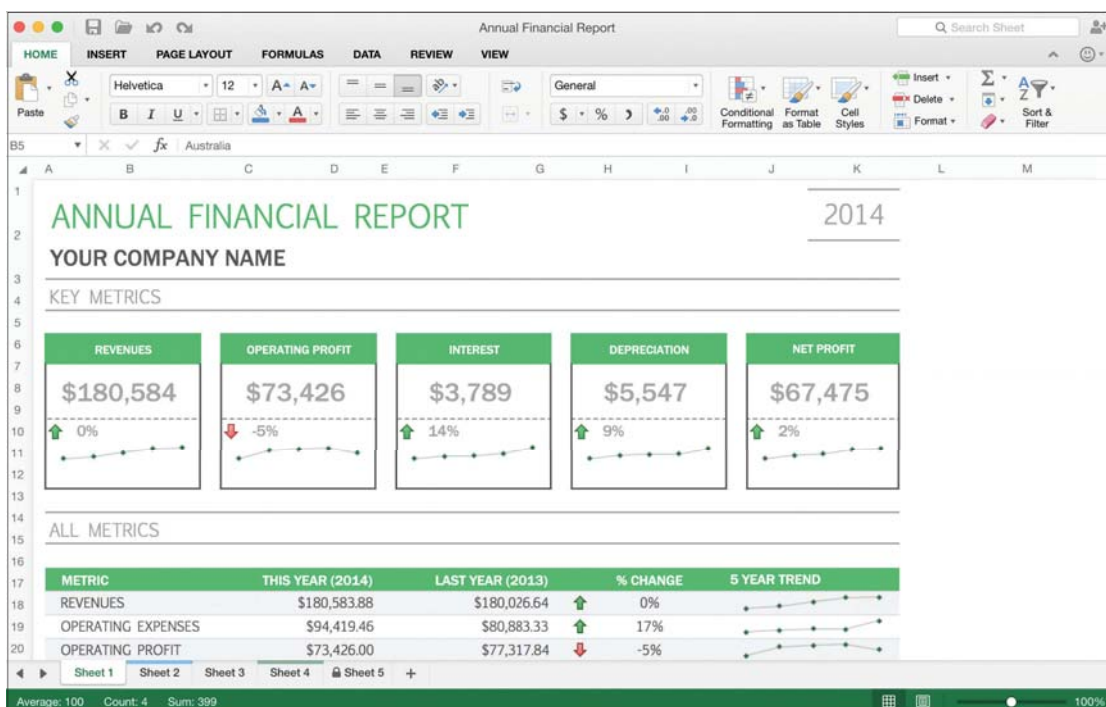


£TBC

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■ microsoft.com/en-gb

Specifications  
OS X 10.10 or later

# Microsoft Excel for Mac 2016



Microsoft is very proud of the fact that Excel for Mac (like Word) is now compatible with Windows keyboard shortcuts. In other words, among other things Ctrl+C will now copy, as will the same-old ⌘+C that's been used on Macs since 1984. This will certainly appeal to number crunchers who've bought a MacBook Pro to replace their Lenovo or Dell.

Another seemingly trivial new feature is an animated effect when you select a different cell. The highlight now slides over, as if on an icy surface, an effect also seen when selecting a range of cells via dragging. To be honest, this can take a little getting used to and feels less

certain than the click-and-drag that's again been pretty much de rigueur since 1984. However, we forgive it because it looks so cool.

Those who use Excel for more than simple accounting will appreciate the fact that pivot tables can now have slicers - buttons that you can add to filter data and that also indicate which filter is currently in use. Statisticians will appreciate substantially beefed-up analysis tools, including the popular Analysis ToolPak.

Elsewhere, however, the differences are largely cosmetic and/or an attempt to bring Excel into line with its Windows sibling. As with the other new Office apps the ribbons have been rationalised

so that there are fewer of them, with the Tables ribbon now being reduced to a button on the Insert ribbon, for example. The result is that Excel now feels tighter and looks significantly less bewildering.

The status bar at the bottom of the screen also receives the same colourful redesign as the other apps although here this has useful repercussions. Whereas switching the Sum count on the toolbar

to alternatives such as Max, Min and Avg required you to click its drop-down list in the older Excel, now you right-click the status bar, where these are shown as part of a larger list of options. Additionally, more than one can be shown at a time - in fact, you can now have all of them displayed on the status bar if you wish (and have enough space).

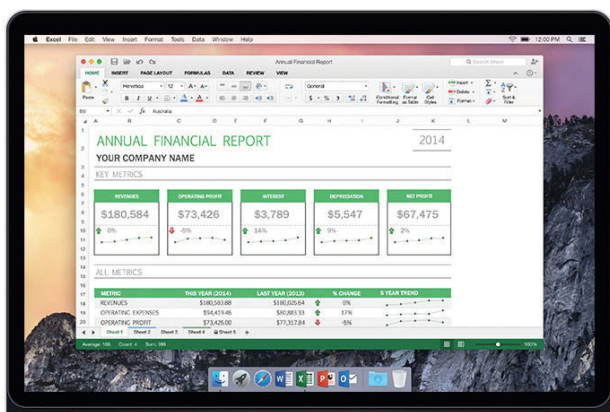
One small but welcome update we noticed was that the password box that appears when you click Options in the Save As dialog box now appears alongside its parent window, rather than causing it to disappear and then subsequently reappear - a nice example of attention to detail.

Of all the apps here Excel felt the buggiest. A few times the title bar became garbled, with the filename running into the search field. We have little doubt Microsoft will fix this before the final release but for the moment - caveat emptor.

## Macworld's buying advice

In line with all the Office line-up there's much to commend within the new Excel. While there's little need to switch from the old version unless you work collaboratively or are a true power user, the new version is welcoming and feels good to work within. **Keir Thomas**

Macworld  
PREVIEW



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# Adobe Premiere Pro CC

Last year, as I was sprinting down the street trying to stay ahead of six angry bulls in Pamplona, Spain, I held my phone behind me to capture some video of the experience, all the while thinking, how am I going to colour-correct this video? And then I looked up at the beautiful old buildings facing the street and thought, hey, that palette would work well with the talking-head videos I had been editing in my hotel room the night before. But how to capture those colours and reuse them? Thankfully, Adobe has solutions for these vexing problems in the latest version of its video-editing application, Adobe Premiere Pro CC 2015.

Okay, so I didn't run with the bulls, but if I had, I could have used two iOS applications, Adobe Premiere Clip and Adobe Hue CC, which attempt to expand video editing beyond the desktop. Adobe Premiere Clip has been around since 2014 and lets you make simple edits to video on your phone and then upload the composition to Premiere Pro, which will retain the edits and let you make additional ones. Hue CC is new; you can use it to take photos and capture their 'looks' – colour hue sets – which you can then import into Premiere CC and apply them to other videos. So, for example, you could capture a cold, cloudy beach, with its blueish, muted colours, and apply them to a nice, short video of a bull chasing you.

Adobe's integration of these applications isn't yet universal,



**Use Adobe Hue CC**

to capture colour looks from camera shots; press on the colour balloons to adjust the look before uploading to your Creative Cloud library.



though it soon will be. Now, you can create a look in Hue CC or in Premiere Pro CC, and also apply looks from your library.

## Pick a colour

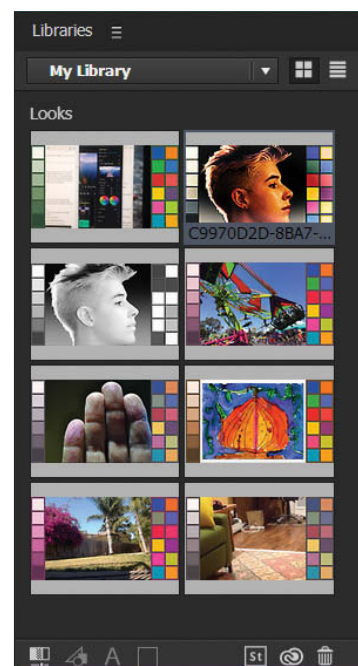
You can create looks in Premiere Pro CC 2015 by using a new Lumetri Color panel. The program picked up the Lumetri Color engine from Adobe SpeedGrade in 2013, but then, you couldn't create looks in Premiere Pro; you had to create them in SpeedGrade. Now, you can import and export look files, but only using the Lumetri Color panel. In the Effects panel, you'll find Lumetri Presets, though you still can't add any to this list unless you use SpeedGrade.

However, if you drag a Lumetri Preset to a video on your timeline, it will appear in your Effects Control panel as a Lumetri Color effect, and you can edit it there. You can access looks from your Libraries panel, which pulls from your online Creative Cloud account, though they do not show up as options in your Effects panel or even the Lumetri Color panel. They will appear in the Lumetri Color panel once you've dragged them from your Libraries panel to your timeline video. You can't import a look by using the Lumetri Color panel; you can only do so by using the Libraries panel.

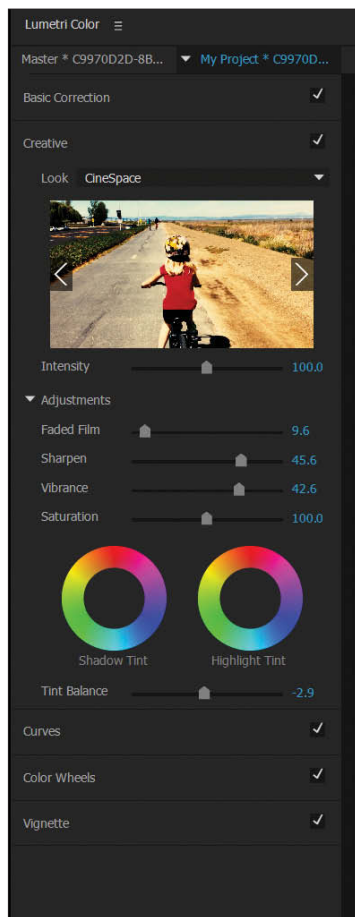
The Lumetri Color panel has a large number of controls, many of which overlap with other colour controls – some are even named the same – but they often don't do the same thing or with the same power. For example, you can add the Three-Way Color Corrector as an effect to

a video, and you can add Lumetri Color as an effect, too. Both have colour wheels for shadows, midtones and highlights, but using similar settings in each and then toggling between them will show dramatically different results. Furthermore, the Lumetri Color panel uses check marks to enable or disable settings, whereas most other effects use the 'fx' icon. You can't set keyframes in the Lumetri Color panel, either; for that, you must use the Effects Controls panel.

The point of the Lumetri Color panel is not colour correction, though you can certainly use it for that. Premiere Pro CC has plenty of



**Create looks with Adobe Hue CC**, and they will become available in Premiere Pro's Libraries palette.



**The new Lumetri** Colour palette lets you create looks and see a preview of how they'll look on your video.

colour correction tools, including the aforementioned Three-Way Color Corrector. Rather, I believe that it is better suited for creating and applying bold, atmospheric styles, feels, looks – sepia, noir, cold and grey – not for trying to achieve spot-on, accurate colour.

Premiere Pro's updated task-oriented workspaces are a little more useful than workspaces in the past. You can still switch among them, choosing from standbys like Editing, Effects or Audio, and

Assembly	Alt+Shift+1
Audio	Alt+Shift+2
Color	Alt+Shift+3
Editing	Alt+Shift+4
Effects	Alt+Shift+5
Metalogging	Alt+Shift+6
Reset to Saved Layout	Alt+Shift+0
Save Changes to this Workspace	
Save as New Workspace...	
Edit Workspaces...	
Import Workspace from Projects	

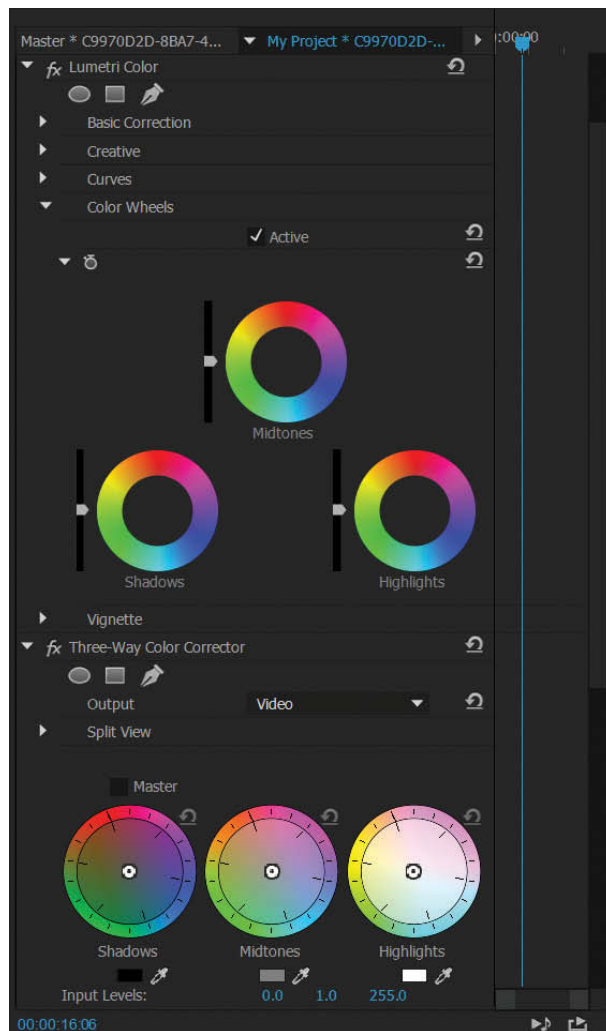
**New task-oriented** workspaces are more-optimised workspaces for certain task sets.

a new Colour one, all of which are optimised for their respective functions, and you can create your own custom workspaces. You don't have to go to a menu, either – a list appears in a small horizontal menu at the top of the screen.

Adobe has added two new features to help your talking-head videos shine. Face Tracker lets you draw a mask on a face and then apply effects to the mask, even as the face moves. This seems like an enhancement of the Masking and Tracking feature introduced in Premiere Pro 2014, which was mainly for applying identity hiding masks. Now, you can use it for more precise effects, such as changing eye colour, applying a nice tan, or making steam burst from one's nostrils. As with most such effects, I found that it worked best with a person looking directly at the camera. A fun extra: you can export the Face Tracker data for use in Adobe's new Character Animator, a feature found in Adobe After Effects CC 2015. You can make weird facial expressions, save them, then apply them to an animated character, which will then mimic your expressions.

When editing talking-head video, often we want to edit out the pauses and the boring parts. Premiere Pro's new Morph Cut can help disguise the transition between two clips, but only if they are of people's faces. It won't even let you try it on, say, beach scenes. I found it worked well as long as the face in the preceding clip was positioned close to where it was in the subsequent clip.

If you're faced with the opposite problem – your talking head blathered on too long, and you have to hit a precise video duration, then the new Time Tuner option in the Media Encoder may help.



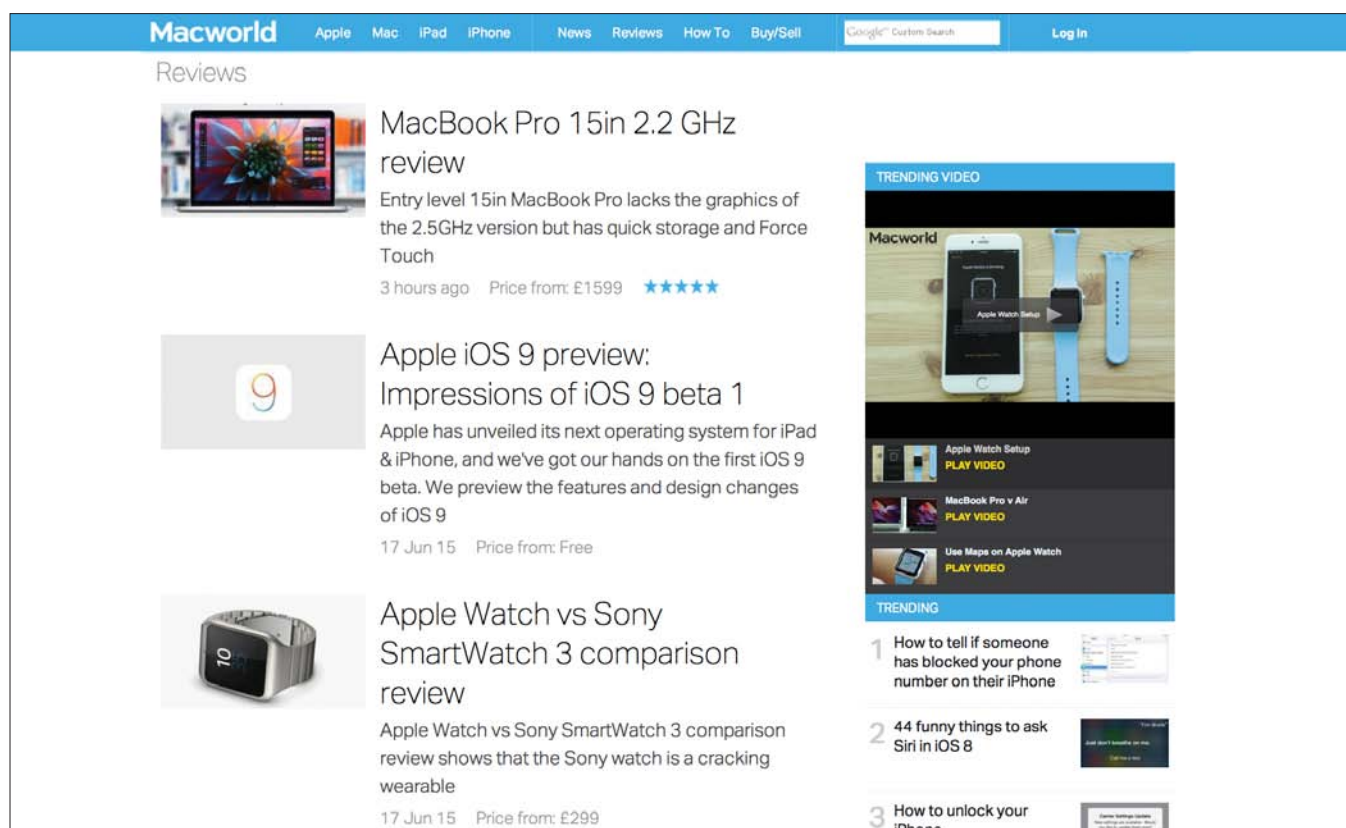
You can enter a duration change of up to 10 percent, plus or minus. If you prefer, you can just set an exact duration, and Premiere Pro CC 2015 will add or remove frames to hit that target. Whichever method you choose, it will not let you exceed 10 percent, which is probably good, because even a 5 percent increase in duration caused occasional, obvious interpolations in my exported video. A 3 percent decrease looked better, but I could still see some artifacts, but perhaps that's because I was looking for it.

### Macworld's buying advice

Premiere Pro CC 2015 is becoming more than an application where we dump all of our assets and then work on them in just that small box. It makes sense to bring the video editing tools closer to the actual captured video, and to expand our creative options beyond the desktop (or laptop, of course). The integration still feels clunky at times, but I like the direction. **Jeff Carlson**

**The Lumetri Colour** effects and the Three-Way-Colour Correct effect offer the same colour wheels, but they work differently.





# Why product reviews are better than ever

Product reviews will never be perfect, but they're still better than ever

**B**rian X. Chen spent some of his first years in the journalism business testing and reviewing products for *Macworld*. These days he writes for the *New York Times*, and recently he wrote an article about the failings of product reviews.

As someone who has himself written hundreds of product reviews, I was fascinated to read Brian's piece. It's an accurate discussion of the limitations of product reviews, though I'm not sure the problems can ever truly be fixed.

First, a recap. Brian bought a well-reviewed Samsung oven, and it broke. At this point, he fell into a bottomless pit of bad customer service – and realised that despite all his diligent research, including reading numerous product reviews, he never really learned anything about how difficult Samsung would be to deal with if his oven ended up being defective.

Defects happen. Anytime a company mass produces a product, some

percentage will be lemons. It doesn't mean the overall product is necessarily bad – though the higher that defect percentage, the more you've got to wonder – but that's cold comfort to the owner of a lemon. If you are lucky and the company you're dealing with has a strong warranty policy and offers good service and support, you should be fine.

## What's a reviewer to do?

As Brian realised, most of the product reviews out there, including the ones here at *Macworld*, are focused on the product itself, and its performance fresh out of the box. There are practical reasons for that. People want to read about products when they're new – a review written after spending a year or two with a product would be vastly superior to one written after a day or two, but fewer people would read it (and the product may even have been discontinued by then).

Then there's the issue of trying to measure service and support. This one's brutally hard to do, and that's why most organizations don't even try. In my early days at *Macworld*, we debated this one a lot, and made several false starts at trying to evaluate support. At one point, *Macworld* considered the vendor's available hours of telephone tech support when calculating a product's rating.

But what if you really want to test customer service? First, you have to invent a fake complaint – and those can be hard to think up. If the product you're using was provided by the vendor, they may figure out that the request is coming from a reviewer and give you a different experience from a regular customer.

And even if you do manage to make up a fake problem and get a single, normal customer-service interaction, is that really enough to make a judgment? What if you got the company's best or worst customer service rep, or just an

average rep on a bad day? A single experience really doesn't tell you much, and pretty much no editorial budget is going to survive trying to expand customer-service testing to the point where you've got a reasonable sample size. This is why we punt.

Now, this isn't to say that there aren't good attempts out there to quantify a company's customer-service abilities. Research companies survey consumers in an attempt to find out which companies tend to be good or bad at customer service. Consumer Reports (the US equivalent to Which?) polls its own subscribers about long-term support issues with products, as well as the quality of a company's support efforts.

These can be helpful, but there's still so much variation. Does this year's model break more than last year's? Does Samsung do a terrible job of supporting ovens, but a good job of supporting phones, because the two are managed by entirely separate divisions?

I bought a Samsung washing machine a few years ago. The reviews were good, I got it for a good price, and I've been very satisfied with its operation. But about a year in, it sprung a leak. And that's when we discovered that, unlike most washer brands we could have bought, there was no local appliance-repair man who was qualified on Samsung washers. We had to get someone from an hour away to drive over and look at the problem. (He fixed it, and the washer's been fine since then.) I'd never considered the availability of qualified repair personnel when reviewing a product, but when my washer sprung a leak, it turned out to be a big deal.

## One person's opinion

In the *New York Times*, Brian writes: "Product reviews are broken. They are great at telling you about the speed of a computer or the brightness of a screen. But there's a big gaping hole in evaluations of most products." He's right about the gaping hole, but he's not right about reviews being broken. I'd argue that the state of product reviews today is, in fact, better than it's ever been.

When I started reviewing tech products in the 1990s, it was the era of the big publisher. You could literally name every publication that would review Mac or PC products, and the list wouldn't be very long. The attitude of these publications – including my own – was that they were offering the definitive pronouncement about the quality of a product. The stone tablets came down from the mountaintop, and inscribed on them were the appropriate number of mice or stars or whatever that told the true story of the quality of that product.

The people I worked with back then – writers, editors, and analysts in testing labs the likes of which simply don't exist anymore – tried very hard to live up to the ideal of finding the absolute truth about a product's quality.

But the truth is that product reviews have always been personal, biased, and idiosyncratic. Scoring systems are made by people with their own opinions about what aspects of a product are more or less important. Reviewers bring their own usage history to the party. In those days, we cloaked all of that behind a veil of utter impartiality, but of course all our biases were baked in.

Product reviews are, ultimately, just one person's opinion, a lesson I learned from Rick LePage, my predecessor as

editor-in-chief of *Macworld*. A review that shows off the voice and experience of the writer is more truthful and more valuable than one of those old-school 'impartial' reviews. When I write a review today, I bring two decades of history and a whole lot of consideration with me, but in the end, a review is still my opinion. It's based on my experiences and biases and readers should know that. (In fact, I think readers prefer reviews that are open and have a distinct voice.)

People who grew up in an era where reviews seemed like absolute declarations might find it terrifying that we now live in an age where publication reviews are more personal and even professional product reviewers admit that they check Amazon user reviews before they buy anything. But those Amazon reviews, the good ones and the bad ones, can be incredibly instructive in painting a picture of a product. And then there are new sites that are adding thoughtful, practical voices to the product-review conversation, and trying to boil down the consensus of editorial reviews and user reviews in order to find the right buying advice.

So are product reviews broken? No, but they're also not perfect. Admitting that, and that every product review is a voice in a larger conversation, is a big step in the right direction.

Here's why the 2.2GHz MacBook Pro is still a worthy purchase

Macworld

Rating: 4.5 stars

Price: RRP: £1,599.00

Pros:

- New Force Touch trackpad
- Fastest flash drive technology available

Cons:

- Running an older processor than hoped
- Battery life measured as 30 mins shorter than 2.5 GHz model

MacBook Pro 15in 2.2 GHz review

Two models of 15-inch MacBook Pro with Retina display have been in production since the Apple's best notebook launched in late 2012. And both these models were again refreshed in June 2015, with important updates made to the trackpad and the flash-storage specification.

We covered the top MacBook Pro model with its additional discrete graphics processor recently — now we focus on its twin (product code: MJLQ2B/A) that

TRENDING VIDEO

Macworld

Apple Watch Setup

PLAY VIDEO

MacBook Pro v Air

PLAY VIDEO

Use Maps on Apple Watch

PLAY VIDEO

TRENDING

- 1 44 funny things to ask Siri in iOS 8
- 2 The 114 best iPad & iPhone games
- 3 How to unlock your iPhone
- 4 Best Mac antivirus



# Apple opens up watchOS

Apple Watch apps will get much more useful with watchOS 2, explains Jared Newman

**A**pple is removing the training wheels for Apple Watch app makers, letting them take full advantage of the device's hardware. Currently, apps can't function without a paired iPhone, which handles not just internet connectivity but core functions such as the app's logic. These apps also can't tap into key hardware features such as the microphone, motion sensors, the heart-rate monitor and the Digital Crown.

All that's going to change now that Apple is allowing native app development on the Watch. The new apps should start to arrive this autumn, alongside the release of watchOS 2 and iOS 9.

**Why this matters:** The Apple Watch is an exquisite piece of hardware, but one that can be extremely frustrating to use. Users are frequently confronted with loading screens, as third-party apps struggle to load everything they need from a paired iPhone. And when these apps finally load, most of them are of limited utility. The new powers that Apple is granting to app makers, along with some added features in watchOS 2, should go a long way toward turning the Apple Watch into a useful accessory.

## Better apps and more

Let's start with a rundown of what Apple is making available to app makers:

**Native apps:** By moving the app logic from the iPhone to the Watch, apps should have faster load times. The Watch will also be able to connect to known Wi-Fi networks, so apps that depend on an Internet connection can work even without an iPhone in Bluetooth range.

**Sensors:** Apps will be able to play audio through the Watch's built-in speaker, record audio through the microphone, detect motion from the accelerometer, and read heart-rate data.

**Input:** Developers will be able to use the Digital Crown for custom app controls, such as dials and scroll bars. They can also create custom sound and pulse alerts with the Taptic engine.

**Health:** Third-party fitness apps will run without a paired iPhone. The data from these apps can feed into Apple's daily activity reports, and can integrate with Apple's HealthKit framework.

**Complications:** Straight from the watch face, users will be able to glance at information from third-party apps, such as sports scores, flight information and smart home status.

Apple isn't just relying on app developers to make the Apple Watch more useful. It's also adding some of its own new features in watchOS 2.

The watch face, for instance, will allow for custom photos and slideshows, along with Apple-made timelapse images of popular cities. Watch faces with Complications will also let users scroll on the Digital Crown to see information. There's also a new night-time mode that displays an alarm clock when the watch is resting on its side.

On the communications front, users can add people to the contacts dial, create Digital Touch sketches in multiple colours, reply to emails, and conduct FaceTime Audio calls. Users will also be able to share their workout achievement medals over Facebook or Twitter.

Some features from iOS 9 are making their way over to the Watch as well, including public transport directions and loyalty cards for Apple Pay. Siri is also getting some new powers, including the ability to control HomeKit devices with prompts such as "turn on the heating".

As with all software updates, watchOS 2 will be free, though Apple hasn't given an exact release date.





# Apple watchOS 2 features

Caitlin McGarry reveals 10 watchOS 2 features that make the Apple Watch worth buying

**T**wo months after Apple Watches began arriving on doorsteps around the world, Apple already has a major update in the works. While watchOS 2 won't debut until this autumn, the Cupertino company used its

annual Worldwide Developers Conference keynote in June to show off what you can expect from your upgraded watch. Get ready: these 10 features will turn the Apple Watch from a nice-to-have into a must-have.

third-party apps can run natively and collect that information on their own.

Ideally, this means we'll see developers make use of features like the Taptic Engine in interesting ways. You can

1.

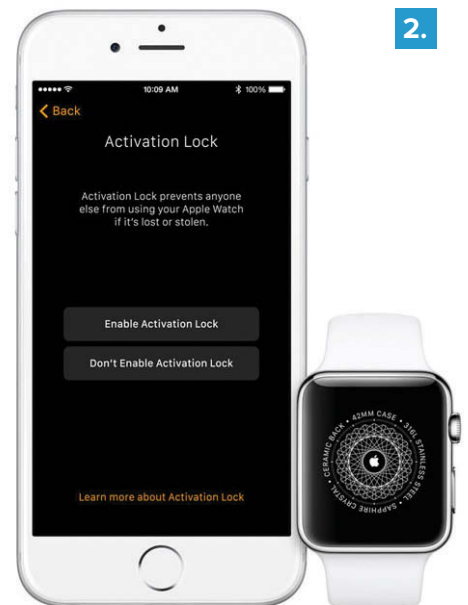


## 1. Apps gone native

Watches shipped with watchOS 1, which supports third-party apps but requires them to push all of the heavy lifting to your iPhone. Apps that don't run natively (so anything other than Apple's built-in watch apps) currently aren't allowed to tap into all of the watch's hardware features, such as the accelerometer, Taptic Engine, microphone and heart-rate sensor. That will all change with watchOS 2. Apple is opening up its features to app developers and allowing them to test the watch's boundaries.

Instead of waiting for the Watch's native Activity app to relay your heart rate to the iPhone Health app using HealthKit,

2.





Time-Lapse face



Complications

also expect your Watch apps to run much faster, because native apps won't have to wait for your iPhone to respond.

## 2. Activation lock

Apple has faced criticism over the Apple Watch's security – specifically, how easy it is to steal and wipe the watch, even if you don't know the passcode, watchOS 2 changes that with Activation Lock.

When you activate your Watch, you'll be required to enter your iCloud Apple ID and password, so the device is tied to your account and no one can use your watch if it's stolen. This feature is optional, but a good move on Apple's part.

## 3. New faces

The current line-up of Apple Watch faces is appealing, but just like with your iPhone home screen background, sometimes you'd rather personalise your device than use a stock image.

WatchOS 2 allows you to choose from either a time-lapsed skyline scene, a still photo from your own collection, or a curated album of favourites that rotates through images in your library every time you raise your wrist. It's a simple change, but a welcome one.

## 4. Third-party complications

Some watch faces (though not the brand-new ones coming in watchOS 2), show complications – little pieces of helpful information such as the time in other cities, the temperature outside, and how close you are to reaching your Activity goals.

The new operating system will open up those complications to app developers, so you can add even more information to your watch face – or swap out weather with something more relevant to you, such as your train departure time.

## 5. Time Travel

The next-generation watchOS offers a new way to view your life with Time Travel. The new feature gives you an overview of your day (or yesterday, or tomorrow). Just use the Digital Crown to scroll through your schedule and see contextual information such as what the weather will be like during your trip tomorrow or the emails you missed from yesterday. A press of the Digital Crown returns your display to its watch face.

If this feature sounds similar to Pebble's Timeline, well, that's because it is. Timeline isn't as elegant as Time Travel, but it's an innovative way to use time as a user interface that goes beyond just numbers on a display. Like Timeline, Time Travel will pull in information from third-party apps, and will be particularly useful on watch faces that allow third-party complications. See our comparison of the two on page 62.





7.

## 6. Apple Pay rewards for you

Apple Pay is coming to the UK in July, and with it will come the ability to use retailer loyalty programs and store credit and debit cards. In the autumn, support will roll out to both iPhones and Apple Watches. Just double-click the side button and pick the card you want to use. You'll be rewarded with points that you would otherwise miss out on, which might boost Apple Pay's use when that feature rolls out this fall. We don't yet know which UK stores will be joining the loyalty programme.

## 7. Public transport on your wrist

We like the Maps app for Apple Watch, which taps you on your wrist to give you turn-by-turn directions instead of verbally interrupting you. But, just like on the iPhone, Maps lacked crucial information for people in major metropolitan areas: public transport directions. Like iOS 9,

watchOS 2 is getting a major Maps upgrade, complete with mass transit info. The watch's Maps app will even give you walking directions to and from your transit stop, so you never have to reach for your iPhone.

## 8. Siri's new power

Because you can only use your voice to communicate with your watch, not text, Siri has become more useful than ever. WatchOS 2 upgrades her to the next level with new capabilities: Now Siri can start a workout for you, retrieve public transit information from Maps, open Glances without a swipe, and communicate with your HomeKit accessories based on your verbal commands.

## 9. Wake me up

When I take off my Apple Watch at night and plug it in, it becomes, for all intents and purposes, useless to me. It doesn't

do anything but sit there and tell me how charged its battery is. That's certainly useful, but watchOS 2 makes your charging watch informative with Nightstand mode.

When you tap the screen, the Digital Crown, or the side button, the Watch will display the time, date, and battery percentage. And when you set an alarm on your watch, you'll be able to click the side button to turn it off or the Digital Crown to snooze it.

## 10. Circles of 12

Some Apple Watch owners have more than 12 friends and felt incredibly limited by the number of slots you could fill in your watch Friends. With watchOS 2, you can add multiple groups of 12 and organise those contacts, the groups, and their names in your iPhone's Apple Watch app. You can also add friends from your Contacts list directly on your watch.



8.



9.



10.



# Time Travel vs Pebble Time

WatchOS 2 borrows from Pebble's chronological data stream. Jared Newman reports

**P**ebble couldn't have been pleased with the smartwatch portion of Apple's WWDC keynote. The tech giant seemed to have taken a page straight out of Pebble's playbook with an Apple Watch feature called Time Travel. Coming this autumn in watchOS 2, it will let users turn the Watch's Digital Crown to view events – past, present or future – straight from their main watch face. A forward scroll, for instance, could show tomorrow's weather forecast, while a backwards turn could reveal the score of last night's game.

Months earlier, Pebble had revealed a similar feature called Timeline as part of its new Pebble Time smartwatch. By pressing up or down on its buttons, users can jump into the past or future to see relevant bits of information. Pebble clearly saw Timeline as a crowning achievement in smartwatch software, with CEO Eric Migicovsky telling *The Verge* that it was unlike anything Apple or Google had come up with. "We've found a new framework to use as an interaction model on the watch," he said in February.

Coincidence or not, Apple has taken a liking to this interaction model as well. But is the Apple version of time-based information a pale imitation, a shameless rip-off or a clever iteration? Upon closer inspection, it's a combination of all three.

## The importance of time

Before we dive in, let's back up and consider why Apple needs a feature like Time Travel in the first place.

In my experience, the Apple Watch is a beautiful piece of hardware with deeply flawed software. While the design is sharper than any other smartwatch on the market, watchOS is incredibly unintuitive.



Most reviewers have picked up on the obvious drawbacks, such as the confusing interface and the sluggish, non-native apps (the latter of which should also be addressed by watchOS 2). But my complaint is more fundamental – in regular use, I'm rarely compelled to do anything on the watch besides looking at notifications and checking the time. Everything else, from playing around with the app launcher to fiddling with Glances, feels like a waste of energy. I might as well just take out my phone.

The missing ingredient is context. With smartwatches, I've taken to saying that if you see an app launcher, they blew it. Sure, picking an app from a list makes sense in a handful of situations, but most of the time, I want my smartwatch to figure things out for me. Using context, it should know what information I need, and understand when to serve it. That way, the watch not only saves time, but provides valuable insight into my day.

It turns out that as a contextual tool, time is important. It dominates so many aspects of our lives that a smartwatch could become pretty clever just by organising its information around time.

That's why Pebble's Timeline and Apple's Time Travel are such important features. Instead of just reminding us of events through notifications, as our phones already do, these smartwatch features give us a quick high-level overview on demand. They're much more powerful than notifications, yet faster than digging through apps or swiping through Glances. In other words, they're a great interaction model for a smartwatch. Pebble's Migicovsky was spot on.

## Pick a time, any time

While Pebble and Apple seem to have created similar systems, in some ways they are very different.

With Time Travel, Apple's use of 'complications' on the watch face could let users combine data points for better insights. Say, for instance, you have one complication for sports scores, and another for sports headlines. A quick scroll back in time might give you the score and a one-line recap. Apple's

**Apple's hardware also lends itself to a time-based interface, with the ability to scroll through time instead of having to tap repeatedly on buttons**



watchOS 2 preview site gives an even simpler example. With calendar and weather complications, you could see the weather forecast for tomorrow's meeting – just in case you're thinking of having it outside.

The robustness of Apple's platform also makes a huge difference. Let's say you wanted to read more of that game recap. A tap on the complication would let you dive into the app for a lengthier description, and from there you might even be able to send the story to your iPhone with Handoff.

If there's an advantage for Pebble, it's that Timeline is less constrained in how much information it can reveal. Whereas the Apple Watch is limited by the number of complications that fit on the screen – you can't pack in more than five right now – with Pebble you can stuff as many points of data into the Timeline as you want,

The fact that Pebble's Timeline is separate from the watch face is also beneficial, in a way that nicely suits Pebble Time's always-on display. Right now, my Pebble Time review unit is rocking a picture of Mega Man on a blue background, and I wouldn't have it any other way. With the Apple Watch, four out of 10 watch faces don't support complications at all, and it looks like the upcoming Photo watch face won't have complications either. Using any of these faces will mean missing out on Time Travel entirely.

### Where Apple excels

Beyond these conceptual distinctions, there are some differences of execution to consider, and here it's hard not to see Apple as the victor.

Right now, Pebble's Timeline doesn't have a lot of developer support (I count 21 apps that integrate with Timeline – and as a result it doesn't feel like the game-changing feature that it could be. In fairness, it's early days for the Pebble Time, but we can safely assume that Apple is going to have less trouble getting developers on board. Even before launch, the Apple Watch accrued more than 1,000 apps – many from major brands that haven't touched Pebble – and Time Travel gives them a chance to occupy prime real estate on users' wrists.

Apple's hardware also lends itself to a time-based interface, with the ability to scroll through time instead of having to tap repeatedly on buttons. I don't get much use out of the Digital Crown now – usually it's easier to just swipe on the screen – but Time Travel could make this hardware flourish seem essential.

That's not to say Apple's mimicry renders the Pebble Time obsolete. If you enjoy the original Pebble's always-on display and multi-day battery life, the Pebble Time is a fine improvement. (My

**With Pebble's Timeline** feature, future events are always just a tap away.

biggest complaints so far: the screen can look dim when it's not in direct light, and the battery keeps falling short of the advertised week-long runtime.) I've ordered a Pebble Time Steel for myself, and don't regret it.

At the same time, I don't fault Apple for running with Pebble's signature software feature. This is how competition works, and now the ball is back in Pebble's court to make its brilliant idea even better. May the smartest watch win.



**Combining multiple points** of data will come in handy with Time Travel on the Apple Watch.



# Manage Apple Watch notifications

Lou Hattersley reveals how to take control of your alerts and get notifications only when needed

**A**re excessive Apple Watch alerts bugging you? Don't worry, you're not alone. Many find the relentless taps from the Watch's notification system annoying. The challenge is finding the right balance: the best amount and type of alerts to receive. You don't want to miss anything, but at the same time you probably don't want to be tapped every time an email arrives or you get a mention on Twitter.

## Mirror vs Custom notifications

There are two approaches to Apple Watch notifications:

**Mirror:** An app using this type of notification simply mirrors the notifications on your iPhone, so when you receive a notification on your handset, you'll also get one on your Apple Watch. This is the default for all the apps on your Watch.

**Custom:** Only the apps preinstalled by Apple have access to the Custom setting. It enables you to set a different notification scheme to the one on your iPhone. It's used in key apps such as Mail and Messages, where you might want less intrusive notifications on the Apple Watch than on your iPhone.

By design, the Apple Watch does not provide a notification if it detects you are currently using the iPhone. This is to prevent you from getting multiple notifications at once.

## Removing Apple Watch notifications from the iPhone

Out of the box all Apple Watch apps mirror iPhone notifications, so it should already be designed to fit your preferences (assuming that you've put a little time into managing your iPhone notifications). But in practice, it didn't work that way for us.

Where the iPhone spends a lot of time tucked in a bag or pocket out of sight, the Apple Watch is on our wrist and tapping us constantly. Suddenly we found every alert grabbed our attention. This can get a little too much.

**Each Apple app on the Apple Watch has different options for notifications, so it's worth investigating them to find a system that works for you**



In this case, we didn't need these alerts on our iPhone either, so the best place to start is by removing unwanted notifications from the iPhone so you get rid of them completely.

To do so follow these steps:

1. Open Settings on the iPhone synced with your Apple Watch
2. Tap Notifications
3. Scroll down to the Include section
4. Tap on an app that is alerting you on the Apple Watch
5. Set 'Allow Notifications' to Off

These apps will no longer annoy you on the Apple Watch or the iPhone.

### Getting a notification on your iPhone but not your Apple Watch

By default, the Apple Watch does not notify you if it detects you are using the iPhone (it defers to the iPhone instead). If, however, you decide you want an app to only ever send a notification to the iPhone, follow these steps:

1. Open the Apple Watch app on the iPhone
2. Tap *My Watch* → *Notifications*
3. Scroll down to the section marked 'Mirror iPhone Alerts from'
4. Set the apps you no longer want to get alerts from on your Apple Watch to Off

Note that this applies only to apps from third-party developers.

### Setting notifications on the Apple Watch

Apple's own apps have more advanced settings that are used to fine-tune the notifications for each app. A common strategy is to set the Apple Watch to show only notifications from people in your VIP list. This way the Apple Watch will not notify you unless somebody important sends you an email.

Follow these steps:

1. Open the Apple Watch app
2. Tap *My Watch* → *Notifications*
3. Tap Mail
4. Choose Custom
5. Scroll down to the Alerts settings



6. Tap iCloud and set 'Show Alerts from iCloud' to Off. (Do the same for any other main accounts)
7. Tap VIPs and ensure that 'Show Alerts from VIPs' is set to On
8. Set 'Sound and Haptics' to On (or Off) as preferred

Now you will only get an alert on your Watch if somebody from your VIP list sends you an email (and if you are not using your iPhone at the time).

Each Apple app on the Watch has different options for notifications, so it's worth investigating them to find a system that works for you.

### More notification settings

There are some further notification settings worth exploring. Tap *My Watch* → *Notifications* and use the following.

**Notifications Indicator:** Set this to Off to remove the red dot that appears on the Apple Watch face when you have items in Notification Centre.

**Notifications Privacy:** Set this to On and you will no longer get details from an app in a notification. You will have to open the app to view message contents.

**Do Not Disturb:** Tap *My Watch* → *Do Not Disturb* and choose between Mirror iPhone or manual. Set 'Mirror iPhone' to Off to choose manual mode. Do Not Disturb can then be activated separately on the Watch using the Settings Glance.

**Clear all notifications:** Pull down from the top of the Apple Watch display to view all notifications. Perform a deep press to access a Clear All option.

# Now is the time to buy an Apple Watch

Why watchOS 2 convinced me to buy an Apple Watch

**O**n 24 April, as many of my fellow geeks were up obscenely late (or obscenely early, depending on your time zone) to order their Apple Watches, I was sound asleep, my credit card tucked snugly in my wallet.

That's because from the beginning, I've been on the fence about the Apple Watch. It's not that I have an aversion to buying Apple's big new products out of the gate. After all, I bought the first versions of both the iPhone and iPad. But none of the reviews I'd read made me see the watch as a must-have device. To the relief of my bank account, I decided to wait and see what kind of reaction it got in the real world. Don't get me wrong: I was curious, just not £340 curious.

Since then I've heard about performance issues, dissatisfaction with the absence of native apps, features that were 'dropped' from the shipping version of the watch, and more. I've seen people complain about their watch, criticise their watch and even break up with their watch. So even though I'm filled with as much geek lust as the next person, I made up my mind to wait until version 2. The funny thing is, I thought I meant hardware.

## It's the software, stupid

Packed in among the announcements during the keynote at Apple's WWDC was the news that would pique my curiosity and lighten my wallet. Just six weeks or so after the Apple Watch started to ship, the company announced a major upgrade to its operating system that wiped out virtually all my complaints and concerns.

**Native apps:** Up until now, third-party apps ran on your iPhone and basically used the Apple Watch as little more than a specialised remote display. The ability to run apps directly on the watch should do wonders to correct the laggy performance issues associated with them. And even better, it should open



the floodgates for cool new apps that use the watch's hardware features – including its sensors and taptic engine – in innovative new ways.

**Time travel:** You can already scroll through your calendar with a swipe of your finger or a twist of the Digital Crown inside the Calendar app. But the new Time Travel feature will let you whip forward or back in time right from the watch face, and the complications (including your schedule, the weather, even your remaining battery life) will change before your eyes.

**Souped-up Siri:** Without an onscreen keyboard, the ability to use Siri to dictate replies to emails and texts in addition to contextual suggestions is a welcome improvement. Add to that Siri's newfound ability to start a workout, open Glances, get transit information, and even control HomeKit devices, and you're talking about a seriously useful device.

**Everything old is new again:** It's not just the new features of watchOS 2 that pushed me over the edge. There are already plenty of features on the Apple



Watch that I'm looking forward to trying. As an iPhone 5s user, the Watch will mean I can use Apple Pay and stop pulling my credit card out of my wallet.

With watchOS 2, all the improvements and new features team up with the nice-to-haves of the original watch to make it a much more compelling proposition. The new version also brings a slew of new nice-to-haves, including Nightstand Mode, being able to use my own photos as watch faces, and Activation lock. These are things that don't factor into my decision individually, but cumulatively, they add up to that well-rounded experience we expect from Apple. It's a package that feels complete and polished. It feels like this is the Apple Watch that Tim Cook and company wanted to deliver in the first place.

## Are we there yet?

It's no surprise that as the watchOS continues to improve, it will appeal to a wider audience. The question is when does it get good enough for you? For me, that threshold is watchOS 2. Now if Apple would let me buy a Silver Aluminium Watch with a Black Sport Band, I'd be downright thrilled.

# Work smarter with an Apple Watch

Caitlin McGarry's four must-have Apple Watch apps will let you work from your wrist

**N**o-one knows for sure how Apple Watch will fit into their lives until they buy one, but one thing is certain: it's going to be a lot easier for your job to slide to the forefront of your thoughts with Watch notifications from collaboration apps such as Slack, HipChat and Trello.

But those notifications might just be more useful on your Watch than your phone. When a colleague mentions you in a Slack room or pings you on HipChat, you can glance at the message and quickly respond without diving into other 'work' tasks on your iPhone.

Here are four Watch apps that will help you manage your work life.

## Slack

More than 750,000 people use the popular productivity app Slack to chat and share documents with their work teams every day. The Watch app will let you read and reply to your most recent direct messages and keep track of unread mentions. You'll be able to cherry-pick a preselected response or dictate your own quick reply.

"We wanted to fill the gap between your phone and your day-to-day experience," Slack mobile head Brady Archambo told *Macworld*. "Imagine you're walking down the street going to work. You feel a buzz. You often don't want to pull out your phone while you're walking. Notifications are a large part of the Slack experience, and they're supported very natively on the Watch."

There won't be a Glance view for Slack at launch, because the company is still figuring out the best way to view channels on the Watch. Archambo also hopes the next version of WatchKit will

allow apps to run continuously, so people can keep Slack open all day, but don't expect that anytime soon.

## HipChat

If your company uses Hip Chat, you'll be familiar with the buzz of notifications you receive from colleagues on your phone when you're offline. The Watch app aims to cut down on the noise and help you manage the notifications you need to respond to without taking you out of your real life.

"I can use my Watch to decide: do I pull my phone out? Do I use a laptop to deal with this thing? I can do a quick acknowledgement to stay in touch with my team," HipChat engineering head Steve Goldsmith told *Macworld*.

You can respond to a message with emoji or a voice-dictated reply and hand off a conversation to your iPhone or Mac if it's getting too serious to handle on the Watch. Goldsmith is excited for the possibilities of using haptic feedback to deliver notifications, and the real-world potential for voice dictation. One use case could be dictating actions to a third-party app integrated with HipChat – for instance, creating an Asana task from a HipChat comment you dictate to your Watch.

## Evernote

Like other apps to help you get work done on the Apple Watch, Evernote is all about quick interactions that can be handed off to your iPhone if need be. You can add notes, set reminders, check



items off your to-do list, and start reading a note that you can pick up later on your phone. For many Evernote power users, the biggest Watch feature will be search. You'll be able to scour your notes for keywords, which will come in handy when you need to think of something right. This. Instant. Evernote will also show you a handful of notes it thinks you'll find useful, but don't expect to use your Watch to dive deep into a project. For that, hand off a task to your iPhone.

## Trello

Project management app Trello is all about visuals. Think of it as the Pinterest of productivity. The platform uses cards, which are like virtual Post-Its that you can drag and drop into different lists or projects. So how does that translate to Apple Watch?

Trello CEO Michael Pryor told *Macworld* that while the iPhone will still manage the bulk of your Trello workflow, you can use the Watch app to add new cards or tasks, receive notifications about upcoming project due dates, view recent cards you looked at on your phone, and respond to comments from collaborators.

For group collaboration apps such as Trello, being on Apple Watch is another way to let colleagues work together no matter what device they're using.

**Project management app Trello is all about visuals. It uses cards, which are like virtual Post-Its that you can drag and drop into different lists or projects**





# Alternatives to Workout

Caitlin McGarry looks at how third-party running apps stack up to the Apple Watch's Workout app

**T**hird-party running apps are at a disadvantage on the Apple Watch. For example, they don't currently have access to its sensors, which means they can't accurately measure the intensity of your workout and calculate how many calories you managed to burn. They also require some initial setup on your iPhone to make sure that they are tracking the information you want on your wrist, whereas the watch's native Workout app just, well, works. The nail in the

coffin is that you can't use them when you leave your phone behind.

For those reasons alone, Workout wins on its home turf. But there's nothing stopping you from running with Workout and a third-party app simultaneously, if you want the benefits of both (or just want to compare numbers). And if you're already a long-time user of one of the four most popular running apps in the App Store, a Watch version offers a shortcut, so you can hit the pavement without with your phone.

I took Runtastic, RunKeeper, Nike+ Running and MapMyRun for a few three-mile runs to see how they stack up to the Apple Watch's built-in fitness tracker.

## Putting apps through their paces

A fitness app is useless if it isn't easy to figure out while running. If the information I need isn't immediately obvious to me when I'm in mid-stride, then it does me no good. All the apps I tested made it easy to start a run, though they differed in the features and stats available at a glance during my workout.

Runtastic is easily the best running app on the watch because it's as easy to use as Workout, but has a few extra features, including control of my music (when paired with Bluetooth headphones) and

**A fitness app is useless if it isn't easy to figure out while running. If the information I need isn't immediately obvious to me, then it's no good**



**RunKeeper puts workout** training plans on your wrist, which is a useful feature to keep you on track.

the screen I kept returning to: pace per mile. That glance also offered a comparison to previous miles, so I could tell that I was slowing down in mile three compared to mile one. This inspired me to pick up the pace.

Runtastic uses Force Touch to let you pause or end your workout, just like the native Workout app does. After you save your workout data, Runtastic has a couple of useful options to grade your post-exercise mood with an emoji and select the kind of terrain you were running on for future reference and comparison. The app's lone downside was voice coaching – it's a premium feature, but I didn't realise that until halfway through my run, when the app verbally nudged me to upgrade. It's not exactly what I want to hear when I'm running up a steep hill.

I also liked MapMyRun, but for some reason, I couldn't get the app to stay open when I raised my wrist to glance at my pace. It would default to the home screen, which hasn't happened with any other app I've used. It was also too basic, like RunKeeper, with just one screen showing you time elapsed, mileage, and pace per mile – there are no other options. RunKeeper's Apple Watch app gets a little more complex if you choose a training plan workout on the iPhone app, so you know when to adjust your pace to stay on track, which is a great feature I plan to spend more time with.

Nike+ Running is almost as fully featured as Runtastic, but requires a lot of tweaks on your iPhone to get it set up just right. You can listen to music in the app, but you have to preload that playlist in the iPhone app. I also had to use my phone to customise the voice coaching triggers

after I realised the app would verbally pause and resume my run (and interrupt my music) when I had to stop at traffic lights. The app has some cool features, such as a leaderboard to compare stats with friends and a map view of your route, though retrieving a map on the watch is usually more trouble than it's worth.

It's worth noting that three of the running apps I tested estimated I burned more calories and ran farther than the Apple Watch calculated, which is puzzling. I trust its calorie burn estimate due to the heart-rate sensor, but Workout relies on the iPhone's GPS to measure distance, just like third-party apps do. Three of the four running apps matched each other's calories and mileage,

roughly, but not the Watch's. Runtastic matched the Watch's mileage but overestimated my calorie burn, because it lacks heart-rate sensor access. Both Runtastic and the Watch came closest to the Google Maps approximation of my route, though I'm still not sure why.

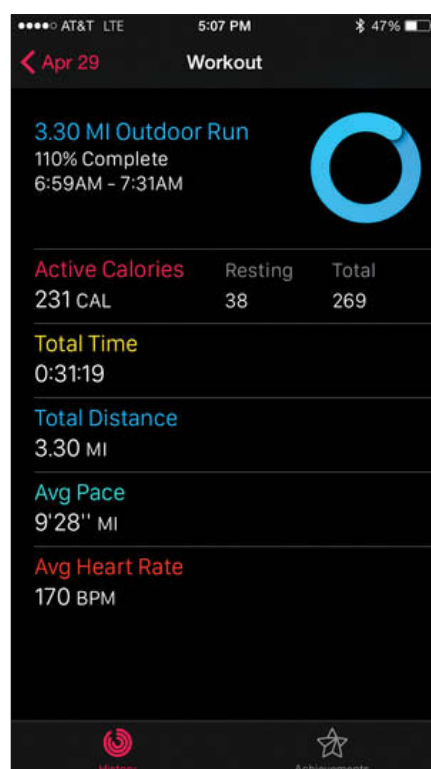
## Why Workout wins

You don't have to play with any settings to get the tracking you want with Workout, although it doesn't have GPS and the Activity app doesn't map out those inspiring post-run visualisations of your route, like other apps do. A GPS-equipped Watch would be useful, and I'm hopeful we'll see that someday.

There are other downsides, though. For example, the device doesn't offer voice coaching, if that's a must-have feature for you. Workout also lacks a corresponding iPhone app to examine fun stats like what your pace was in mile two versus mile three, like Runtastic does. The Activity app does store some Workout data, but doesn't break it down quite like dedicated running apps do. Those are trade-offs to consider if they push you to run faster or longer.

For now, Workout wins, but if you're a long-time user of Runtastic, RunKeeper, MapMyRun, or Nike+ Running, having easy access to those apps on your wrist is a big bonus. And why not stick with what works? No matter which app you use, the Apple Watch counts those stats toward your Move and Exercise goals, which is all that really matters.

**You can see** your workout stats in the iPhone Activity app, but no post-run maps of the route.



# New & noteworthy

Lewis Painter presents the best new iPad, iPhone, Apple Watch and MacBook accessories

## Jabra Sport Coach >>

£199

[jabra.co.uk](http://jabra.co.uk)

The Jabra Sport Coach wireless cross-training earbuds, together with the Jabra Sport Life app, enable users to create personalised workouts from over 40 different exercises, with real-time in-ear coaching. The earbuds feature Jabra's trademarked TrackFit motion sensor, which the company claims "provides advanced tracking of pace, distance, step count, cadence and calories". The Sport Coach has a sweat, shock and dust resistance rating of IP55, so you shouldn't worry about damaging it. It also uses A2DP technology that should allow for high quality stereo audio steaming over a Bluetooth connection.



## Olixar Charging Apple Watch & Bamboo Stand with iPhone Dock

£29

[mobilefun.co.uk](http://mobilefun.co.uk)

The Olixar Bamboo Stand is a combined Apple Watch and iPhone dock, crafted from real bamboo that gives the stand a unique look and also enables the dock to be lightweight and sturdy. It has cutouts for tidy cable management, which means both your iPhone and Apple Watch can be charged while docked. It looks to be a nice all-in-one option, especially for those of us with very little desk space. The iPhone dock fits any iPhone from the iPhone 5 upwards, and should be able to accommodate iPhones with cases, too.

## UE Roll >

£99

[ultimateears.com/en-uk](http://ultimateears.com/en-uk)

The UE Roll is the latest addition to Ultimate Ears' portable Bluetooth speaker collection. It has a tough body that its maker claims is "life-resistant", as well as an IPX7 rating, which indicates the speaker is safe from a bout of rain, spillages and even a dip in the pool. The UE ROLL boasts full 360-degree sound, which should allow for clear and crisp listening from any angle. It's also possible to wirelessly pair up two Rolls to either double up on the sound, or provide a stereo speaker experience.





## iBeani

£24

ibeani.co.uk

The iBeani is unlike any tablet holder we've seen before, taking its design from the beanbag. The company claims that the design means the stand can be used on any surface, and that it's easy to angle your iPad for the best view no matter where you're sitting. There are over 20 designs, so you should be able to find the perfect look for you.



## MagBak

\$39 (£25)

1ss.com

The MagBak is a magnetic, fuss-free and simplistic mount for your iPhone and iPad. It uses a minimalist design, with magnets built into the case that attach it to the provided MagBak strips, which, according to the company, can be stuck virtually anywhere. The strips aren't just for portrait use either; they can apparently be used in a landscape orientation, which should make it ideal for watching films or for use as a GPS system in a car. It's also been tested to make sure that it doesn't affect the connectivity of your device, and should also be safe to put against credit cards.



## CATWALK

The best-looking cases for your iPhone, iPad and MacBook

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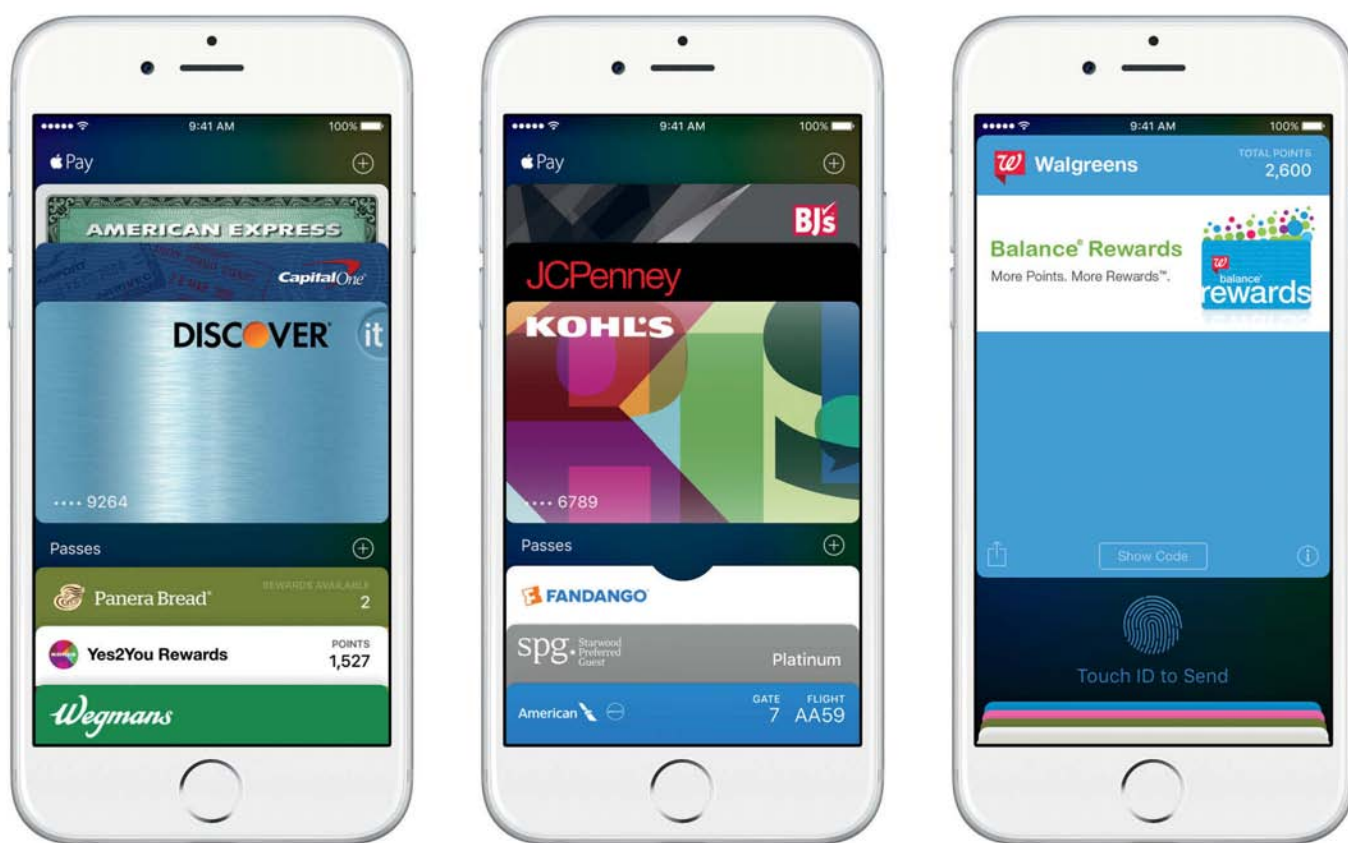


Striipes overlapping iPad mini sleeve  
€92 (£65)  
striiipes.com



Booq Mamba Sleeve for MacBook  
£35  
booq.co.uk





# Your iOS 9 questions answered

Want to know what iOS 9 has to offer? Oscar Raymundo has it covered in our in-depth guide

**W**hen you call “Hey Siri,” you want to know that your phone is actually listening to you. But with the new proactive intelligence in iOS 9, Apple’s personal assistant will start to anticipate your desires before you even have a chance to ask. That’s just one of the improvements announced at the latest Worldwide Developers Conference. Rather than adding a ton of new features, Apple has instead focused on refining the user experience.

This time around, Siri can use your location, time, app usage and connected device data to forecast your needs. Several built-in apps have also either

been given substantial updates (Maps, Notes) or replaced entirely with more exciting alternatives (Wallet, News). Plus, iOS 9 allows you to interact with two app at once on your iPad.

## The basics

**When is iOS 9 coming out?** It will be available this autumn as a free software update. However, members of the Apple Developer Program have already started tinkering with iOS 9, and a public beta program will be available in July.

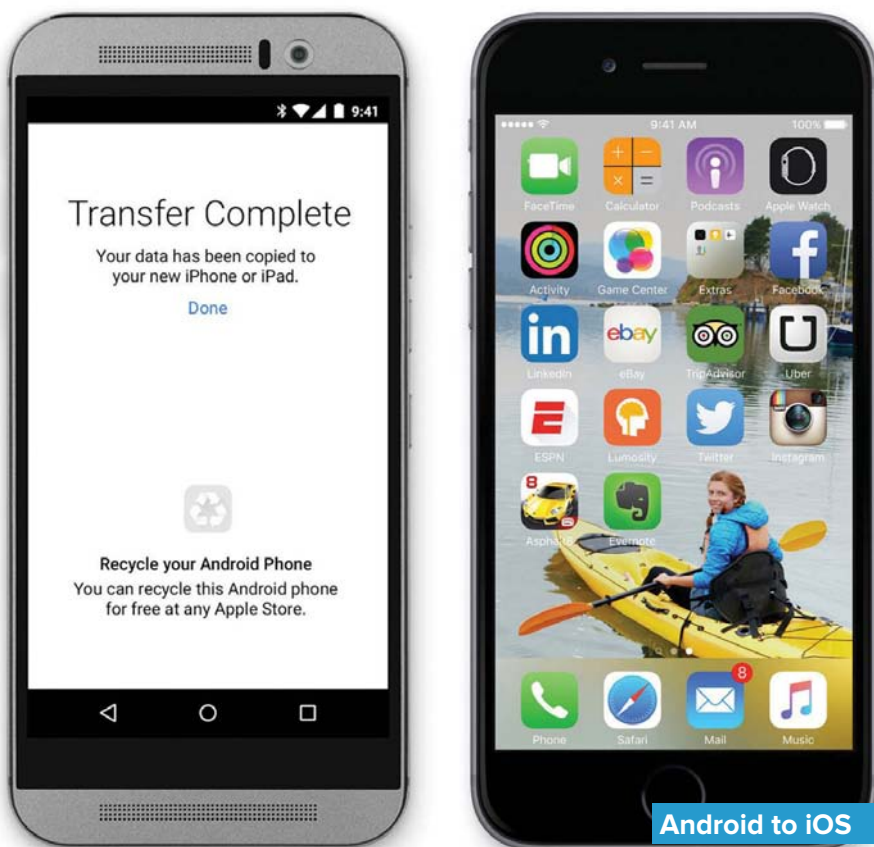
**What devices will it run on?** iOS 9 will run on the iPhone 4s and later, third-generation iPads and later; all iPad Airs

and iPad minis; and on the fifth-generation iPod touch. For a full list see of compatible devices see page 76.

**What’s new in iOS 9?** Apple has massively improved and expanded several essential built-in apps and services. Most notably, Siri is now a much meatier proposition, while Maps has included mass transit data. Furthermore, the Passbook built-in app has been replaced with the Apple Pay-powered Wallet, and the stagnant Newsstand has been replaced by News, a personalised reading app. The new iOS will also give the iPad several new options, including Split View and Picture-in-Picture, for helping power-users get stuff done.

**What about security updates?** iOS 9 brings a couple new security features that should help keep your data safe if your iPhone or iPad fell into the wrong hands.

**Members of the Apple Developer Program have already started tinkering with iOS 9, and a public beta program will be available in July**



Six-digit passcodes will now be offered by default, instead of the four-digit default passcodes we use now, along with native two-factor authorisation whenever you try to sign in from another device.

**I'm considering moving from Android to iOS. Is there anything in this release to**

**help convince me?** Apple has created a Move to iOS app that's designed specifically to convert Android users. Move to iOS is a quick and seamless way for Android users to transfer their contacts, message history, mail accounts, calendars, photos, videos and free apps to their new iPhone. It even adds a list of

paid apps you bought for your Android to your Wish List in the App Store.

**Will this update affect my battery life?**

Yes, but in a positive way. Apple claims that apps and key features in iOS 9 have been made more efficient in order to add an extra hour to your device's battery life. It will achieve this by using the iPhone's built-in sensors, which are used to determine when the device needs to light up and when it can remain dark. Taking it even further, you can enable the all-new Low Power mode when your battery is running low – Apple says this can make your iPhone last an extra three hours.

**Incorporating intelligent assistance**

**Siri on steroids?** In addition to receiving a redesign, Siri is now smarter than ever. You can use the personal assistant to search photos and videos stored on your device by date, location and album title. Siri can also take into account what you're doing on your iPhone at any given moment to create contextual reminders. For example, if you've found the perfect hotel for an upcoming holiday, you can simply tell Siri to "remind me about this" and it will create a reminder linking directly to the web page you were viewing on Safari at the time you set the reminder. Apple has also given Siri the power to provide you with 'proactive assistance'.

**What is 'proactive assistance'?** Siri can now take into account your location, the time of day, recurring activity, usage patterns, the app you are viewing or other connected devices, to better anticipate your next move and provide relevant actions and information. All this before you even have the chance to ask or type in a query. When you plug in your headphones, for example, Siri will offer to start playing the music playlist you typically listen to during that time of day. Or when you connect your iPhone to your car's CarPlay or Bluetooth stereo, Siri will ask whether you want to resume listening to the audiobook you've been enjoying during recent commutes.







## News

**Do I have to launch Siri every time I want assistance?** The thing about Siri's new 'proactive' approach is that it's better integrated with native apps to work in the background and serve up the most relevant information. For example, Siri simultaneously taps into your Calendar events and uses the location, routing and traffic information in Maps to send you a notification when you should leave for an appointment to ensure you make it there on time. Similarly, when you receive a call from a phone number not in your Contacts, Siri can check your Mail messages for that number, in an attempt to identify it for you.

**Why should I care that developers now have Spotlight search API?** iOS 9 will have a more robust Spotlight search engine, which will provide deep links to your downloaded apps right in the search results. For example, if you look for the name of a food in iOS 8, you'll be shown any reference to it in your email, plus results from the internet and Wikipedia. In

iOS 9, however, your results could include recipes from Yummly or any other food apps you have installed. Tapping it will provide a link into that app, so you are taken directly to the recipe you want. Apps such as Vevo, YouTube and Vimeo, will allow you to play a video directly in the search results.

**Improving built-in apps**  
**Maps finally includes mass transit directions. What took so long?** In order to make mass transit directions in Maps as accurate as possible, Apple surveyed individual public transportation stations to compile its own data. The tech giant says the data is so precisely mapped that it can help you work out the best public

transportation route right down to which entrance to use to enter a subway station. Transferring trains at busy stations such as London's St Pancras International will be easier than ever since the transit directions will tell you which way to walk to catch your next train.

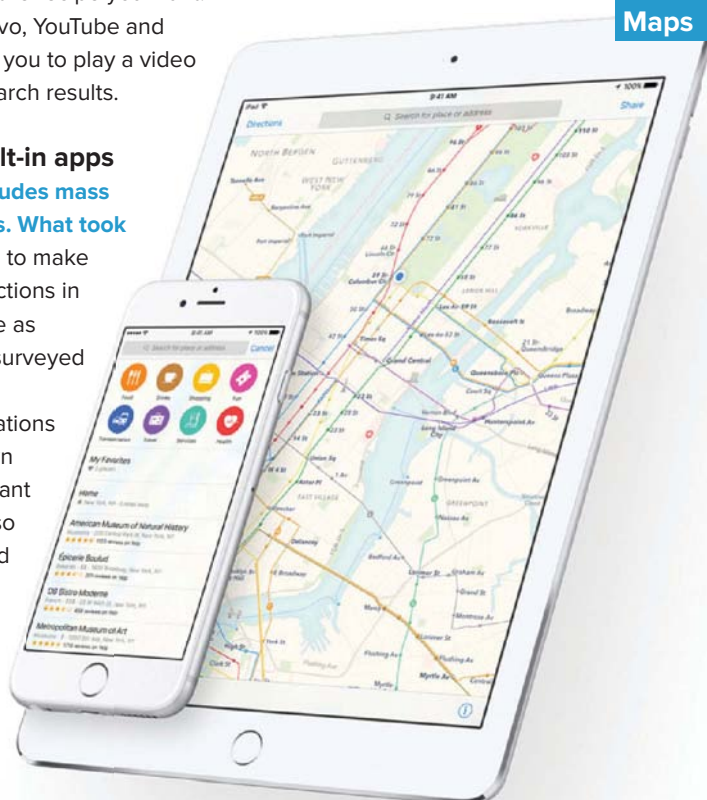
**Can I use Maps' new public transport directions in Manchester, Edinburgh or Cardiff?** No, not yet. The only UK city where these will be available when iOS 9 launches is London, though this is sure to change over time.

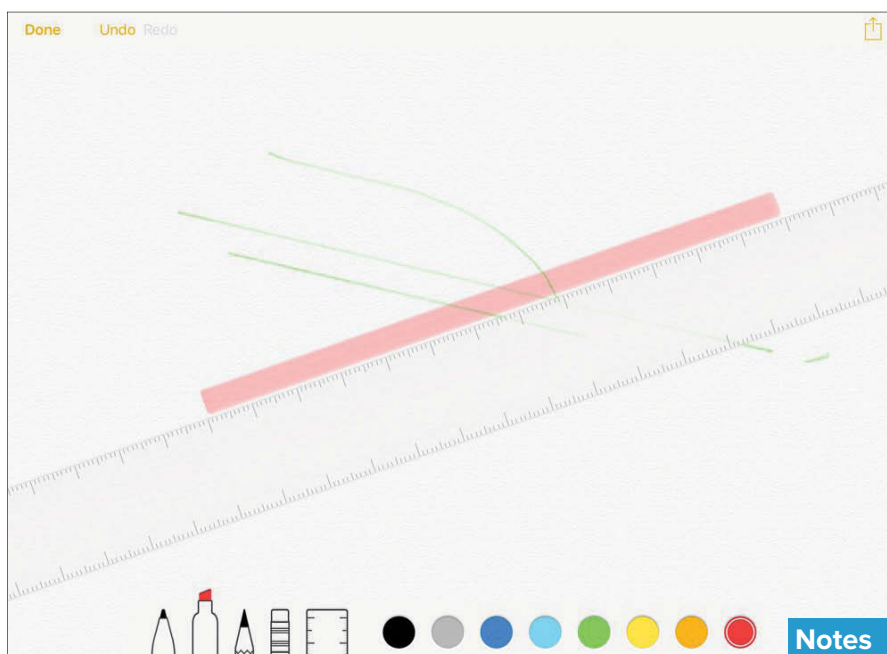
Outside of the UK, Maps' transport directions are available in a number of cities, including New York, San Francisco, Mexico City, Berlin and Toronto, as well as 300 cities in China.

**Anything else new with Maps?** In iOS 9, it also incorporates a Nearby feature that showcases more information from local businesses, including whether they accept Apple Pay.

**Did any other Apple apps get a big improvement?** Note-taking may not be the most glamorous of features, but iOS 9 gives the Notes app enough bells and whistles to compete against Evernote and Microsoft's OneNote. For example, you can now use your finger to create a digital

## Maps





scribble (see above). Other new features include being able to take a photo without having to leave the app to make your notes more visual, while URLs and maps show up as graphical links. Notes can also turn any list into an interactive to-do checklist, giving you the ability to cross off different items one by one. Lastly, the app is now a destination in iOS 9's Share sheets, so you can compile web pages from Safari, directions from Maps, or attachments from another app right into your notes.

#### What's happening to the Passbook app?

In iOS 9, Passbook is replaced with a brand-new Wallet app. You will still be able to store your Starbucks card, concert tickets and boarding passes in your Wallet, just as you do in Passbook.

#### So then why change the name to Wallet?

Wallet is also the home of Apple Pay. For details, see our in-depth guide on page 78.

**Are all major payment services now onboard with Apple Pay?** Yes. It supports transactions conducted by Visa, MasterCard and American Express.

**How many businesses accept Apple Pay in the UK?** According to Apple, over 250,000 locations will accept Apple Pay.

The number is expected to increase over the coming months.

#### Why did Apple replace the Newsstand app with News?

Publishers complained that the Newsstand app buried their content, so Apple came up with a more dynamic solution: a Flipboard-style reading app called News.

#### What can I read using the News app?

Over 50 publications have teamed up to join Apple's News, including *Time*, *Vogue*, *Wired*, *Vanity Fair*, *Cosmopolitan*, *ESPN*, *CNN* and *Bloomberg*.

#### How will News stories look on my device?

In order to keep a consistent design and visual identity, Apple has released a News Publisher app to help publishers create content specifically for News. Publishers will be able to tinker with layouts, typography, photos, videos and animations to create the most compelling content for News.

#### Boosting iPad productivity

##### Are there any new QuickType shortcuts?

iOS 9 introduces formatting buttons to the QuickType bar, so you can italicise, copy/paste or add attachments with just a tap. Furthermore, third-party apps can customise the shortcuts that appear on the QuickType toolbar, so you can have your favourite buttons at your fingertips.

#### I've heard I can now have two iPad apps open at the same time. How does that work?

There are three ways to do this. First, Slide Over lets you choose a second app, which opens up as a pinned sidebar on the right. Next up is Split View, where two apps take up half of the screen. Finally, Picture-in-Picture lets you watch a video or chat on FaceTime, while having another app running in the background. The video screen becomes a smaller window that you can drag and resize.

You'll need an iPad Air, Air 2, mini 2, or mini 3 for Slide Over and Picture-in-Picture, and an iPad Air 2 (or presumably, whatever comes next) for Split View.

#### Productivity







# iOS 9 compatible devices

Lewis Painter reveals which devices will be able to download iOS 9 when it launches in the autumn

**A**pple took to the stage at WWDC 2015 to show off iOS 9, and with the unveiling of the new mobile operating system came the announcement about which iPhones, iPads and iPods will be able to get it when it's released in autumn. Although iPhones and iPads are top of the range (or near the top) when released, as the years go by and new iterations of iOS are released, devices become slow and sluggish; and sometimes they get dropped from compatibility with new iOS updates. But not this year.

Here's a list of every Apple device that supports iOS 9:

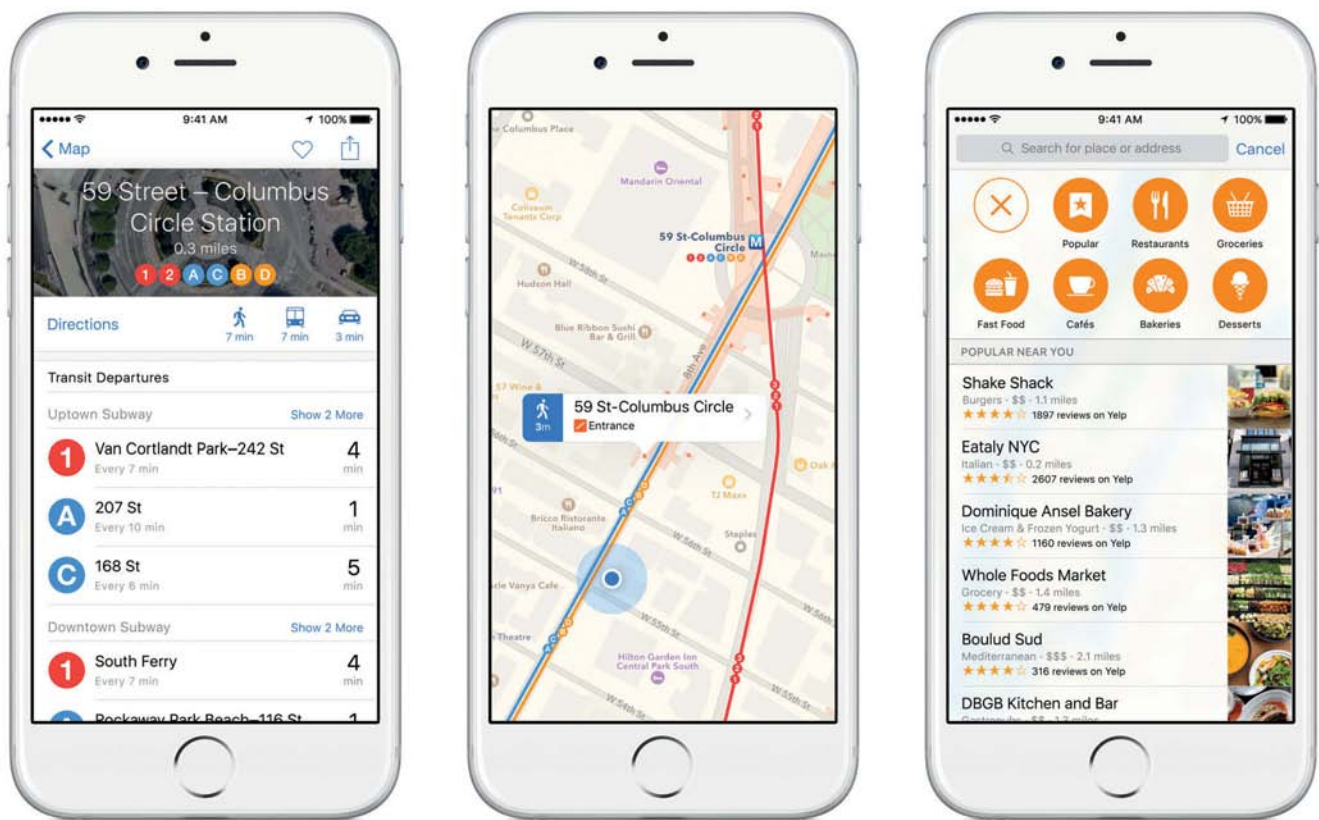
- iPad 2, 3, 4, Air and Air 2
- iPad mini, mini 2 and mini 3
- iPhone 4s, 5, 5c, 5s, 6 and 6 Plus
- iPod touch (fifth generation)
- The next generation of iPhones and iPads will come with iOS 9 preinstalled

So if you've got an iPad 2 or later, and iPad mini of any kind, an iPhone 4s or later, or a fifth-

generation iPod touch, you can get iOS 9, for free, when it launches in the autumn.







# Headaches Apple is fixing in iOS 9

Jared Newman reveals the headaches that Apple is addressing in its latest mobile operating system

Apple's iOS 9 has plenty of major features to look forward to. Just as important, however, are the little things – the minor headaches of previous iOS versions that Apple is now getting around to alleviating. Here are six annoyances that will disappear in iOS 9:

## 1. A less-confusing Shift key

Pop quiz. On the default iOS keyboard, are the letters uppercase when the Shift key is grey or white? Unless you bother to memorise it, this issue has been a constant source of confusion since iOS 7. (The answer, by the way, is white.) Hitting Shift in iOS 9 will toggle the letters on the keyboard between uppercase and lowercase, so there's no ambiguity about what you're about to type.

## 2. A much smaller OS update

With iOS 8, updating from an older device required a whopping 4.6GB of free

storage space. This was a huge barrier for people who wanted the latest software. Apple says iOS 9 will only require 1.3GB by comparison, so even 8GB iPhone 5c users will be able to upgrade.

## 3. Rotation lock for the iPhone mute switch

Previous iPhones might not have needed a dedicated rotation lock switch when screens were smaller. However, the iPhone 6 and 6 Plus are practically miniature iPads, so you might want to quickly enable landscape mode for videos and pictures before switching back to portrait-only. iOS 9 will introduce the option to repurpose the iPhone's mute switch for rotation lock, just like you can on the iPad.

## 4. A search function for settings

As the iPhone has grown more sophisticated, its settings menu has become much more complex, with

dozens of mazelike submenus. It probably won't get any simpler in iOS 9, but at least you'll be able to find specific settings with a dedicated search bar at the top of the app.

## 5. A way back to Safari

We've all been in the situation where a website wants you to install its iOS app, and you either end up in the App Store by accident. iOS 9 will add a 'Back to' button when you hit an app link from Safari, so you can quickly return to the browser.

## 6. A proper app for iCloud Drive

After resisting the idea of an iOS file manager for years, Apple took a step in that direction with iCloud Drive in iOS 8. But while this service provided a common storage directory for apps, it didn't have a centralized app of its own for users to manage their files. With iOS 9, users can expose a proper iCloud Drive app through system settings.



# Complete guide to Apple Music

Leah Yamshon reveals the ins and outs of Apple's new streaming music service

**A**pple single-handedly turned the digital music marketplace on its head when it launched the iTunes Store back in 2003, and now it's going after the current hottest trend: streaming media.

**What is it?** Apple Music combines subscription-based music streaming with global radio-like programming and a social feature that connects artists to fans. It will come preinstalled on all iOS and OS X devices – just like iTunes – but users will be able to stream music instead of purchase music. Pay a flat fee, and you unlock all of Apple Music's extensive 30 million-song library.

**Isn't that the same as iTunes?** Not at all. iTunes is all about media ownership, functioning as both a virtual record store and an efficient digital library for music and other media (movies, TV shows, and so on) that you own personally.

The software comes preinstalled on all Apple devices, and is available as a free download for non-Apple PCs and mobile devices. iTunes doesn't require a subscription fee to use it (unless you use iTunes Match), since every song, album, movie or show was bought individually – either from the iTunes Store or imported or ripped from another source.

Apple Music is all about streaming. You pay a flat fee to unlock access to Apple Music's entire catalogue, but you don't actually own the music you listen to. The files don't live individually on your devices; you're instead just listening to tracks stored remotely, that are owned by Apple. If you subscribe to any other media streaming subscription service, Apple Music will function in the same way.

**So is iTunes dead?** Not exactly. You'll be able to access your entire iTunes library from within Apple Music, and iTunes will still be a standalone app and media store

if you'd prefer to continue to buy music à la carte. However, if you've let purchasing music fall by the wayside, you may never have to open iTunes again if you sign up for Apple Music.

**What makes it different to other music subscription services?** Apple is putting a lot of emphasis on its additional features: Beats 1, curated playlists, and Connect.

Beats 1 is the service's radio offering, and will feature an around-the-clock worldwide live broadcast from DJs based in Los Angeles, New York, and London. It will deliver a curated selection of songs, pop news, and interviews with artists.

Speaking of curation, Apple Music will also offer up recommendations tailored to your tastes, looking at artists you like and serving up other artists and playlists for you to listen to. But instead of being built by algorithms, they are built by real people, according to Apple. You can find these in the 'For You' section of the app.

Connect is Apple Music's artist-based social networking feature, which lets fans follow artists. Artists can share special content with fans through Connect. Apple has shown sneak peeks of Connect profiles for Pharrell Williams, FKA twigs, Chris Cornell, Bastille and Alabama Shakes. The Weekend closed out the Apple Music announcement during the WWDC keynote, and Trent Reznor appeared in its promotional video, so it's safe to say we'll see Connect profiles for those artists as well.

Besides that, Apple Music's library has 30 million songs, and you can also watch music videos.

#### How is the quality of the music?

Slashgear is reporting that Apple Music will stream songs at 256kb/s, which is the same rate as iTunes Match. That's a bit of a drop from Beats Music and Spotify, which use a 320kb/s bitrate. And competitor Tidal boasts more than just major celebrity endorsements: it offers a high-bitrate option (1411kb/s lossless FLAC) at a pricier subscription rate, the 'HiFi' tier for £19.99 a month.

**How much will it cost?** Apple Music will cost £9.99 per month, or £14.99 per month for a family subscription for up to six people (which requires iCloud Family Sharing). You can try a three-month free trial before coughing up.

#### Is there a free, ad-supported version?

Sadly, no. Some aspects will be available to anyone who logs in with an Apple ID – namely, Beats 1, the ability to follow artists on Connect, and the ability to listen to Apple Music radio stations with a limited number of skips, but a paid subscription is required to access Apple Music's entire library.

**If I subscribe to Apple Music, do I still need my iTunes Match subscription to keep my complete music collection together?** According to Apple, iTunes Match and Apple Music will be completely separate services, so it will be up to you to decide if you'd like to keep iTunes Match. If your personal music collection has a lot of rare tracks

and content that you can't get through Apple Music, then you may want to consider keeping both subscriptions.

**Can I save music to listen to offline?** Yes.

**What devices can I use this on?** You can access Apple Music on your iPhone, iPad, iPod touch, Mac, and PC. It will be coming to the Apple TV and Android phones this autumn. It also pairs with the Apple Watch.

**When will it be available?** Apple Music launched 30 on June on iOS, OS X, and PCs, and will expand to Apple TV and Android devices this autumn. You can take advantage of a three-month free trial period to see if you like it.

**How will Beats 1 differ from iTunes Radio?** iTunes Radio takes the Pandora-style approach to radio, where users create their own stations based around songs, artists, albums, or genres, and iTunes serves up songs that flow well around that theme. You can still use a version of iTunes Radio within Apple Music, but it's now called Apple Music radio stations.

Beats 1, on the other hand, will be more like a traditional radio station, with a 27/4 live radio stream anchored by three DJs based in New York, Los Angeles, and

London. Former BBC Radio One DJ Zane Lowe will lead the effort from Los Angeles, with Ebro Darden of Hot 97 in New York, and Julie Adenuga in London. Beats 1 will feature a combination of songs handpicked by these DJs, plus celebrity interviews, pop culture news, and other music-related content. For now, it will be commercial free.

Every user around the world will hear the same content at the same time, and these stations take a more curated approach to radio than iTunes Radio.

**I spent years perfecting my playlists on Spotify and iTunes. Can I import these into Apple Music?** Your iTunes playlists will automatically be pulled into Apple Music when it launches, as will the rest of your iTunes library. If you use Beats Music and switch your subscription to Apple Music, your playlists will sync over. But we're not so sure about playlists from other music services such as Spotify.

**Do Apple Music subscribers have access to the entire iTunes catalogue or are some artists missing?** The iTunes Store sells 43 million songs worldwide. Though we won't know exactly which artists are missing until it launches, Bloomberg reports that the Beatles won't be included with Apple Music at launch – Apple is still working out a deal for those rights.





# Apple Pay questions answered

After all the waiting, Apple Pay is finally coming to the UK. David Price reveals what you need to know

If you live in the US, you'll have been able to use the service since 20 October 2014 – it launched as part of the iOS 8.1 update. Unfortunately, we in the UK have had to wait for the service. We had expected a European rollout date in early 2015, but it wasn't until 8 June that Apple announced it will be launching the mobile payment service in the UK in July 2015.

Apple Pay is compatible with the iPhone 6, 6 Plus and the Apple Watch.

## How it works

Your iPhone's Touch ID fingerprint scanner is key to the whole thing, though you will also need a specific NFC (Near Field Communication) antenna that is built into certain Apple devices.

If a shop supports Apple Pay, it will have a small sensor by the till (see top right image). To pay for an item, simply tap your iPhone on the sensor, your finger on the Touch ID fingerprint scanner to identify yourself, and that's it.

## How to set up Apple Pay

This is simplicity itself – take a picture of your credit card, verify that this is your card and you're ready to go. Your credit card (but not its sensitive data) will then be saved in Passbook; the new red symbol along the top of the Passbook icon in iOS 8 represents credit cards.

## Refunds and returns

There's likely to be some confusion about processing refunds and returns for the first few months after Apple Pay launches in the UK, but it shouldn't be too hard.

Apple explains: "How do I process returns with Apple Pay? Use the Device Account Number to find the purchase and process the return, just like you would with a traditional credit or debit card payment. To see the last four or five digits of the Device Account Number, ask the customer to go to Passbook, tap the card, and tap 'i' on the lower-right corner of the

display. You can also have the customer hold their iPhone 6 or iPhone 6 Plus near the reader, select the card they used to make the original payment, and authorize the return with Touch ID or passcode."

In other words, it should be as simple as touching your iPhone to the reader, but we'll see how it works out 'on the street'.

## Other ways to pay

A good range of apps work with Apple Pay. These currently include Argos, JD Sports, Zara, Domino's and Topshop.

## Security

Apple executives have fallen over themselves to insist security was a priority from day one.

If an iPhone is lost or stolen, for example, you can use Find My iPhone to suspend all payments from that device. There's no need to cancel the credit card, because the number isn't stored on the device, as we already mentioned.

Your credit card number isn't given to the merchant. What you're doing, rather, is creating a device-only account number and storing it in the secure element. "You use a one-time payment number and a dynamic security code," explained Senior Vice President Internet Software and Services Eddie Cue at the service's launch.

The secure element is a hardware component – a chip inside the iPhone 6 and 6 Plus where sensitive data can be stored. 'Secure element' is a generic term for protected memory on smart cards, and the data on the secure element isn't even accessible to iOS (it's only accessed via a random code during the transaction). Hackers wouldn't

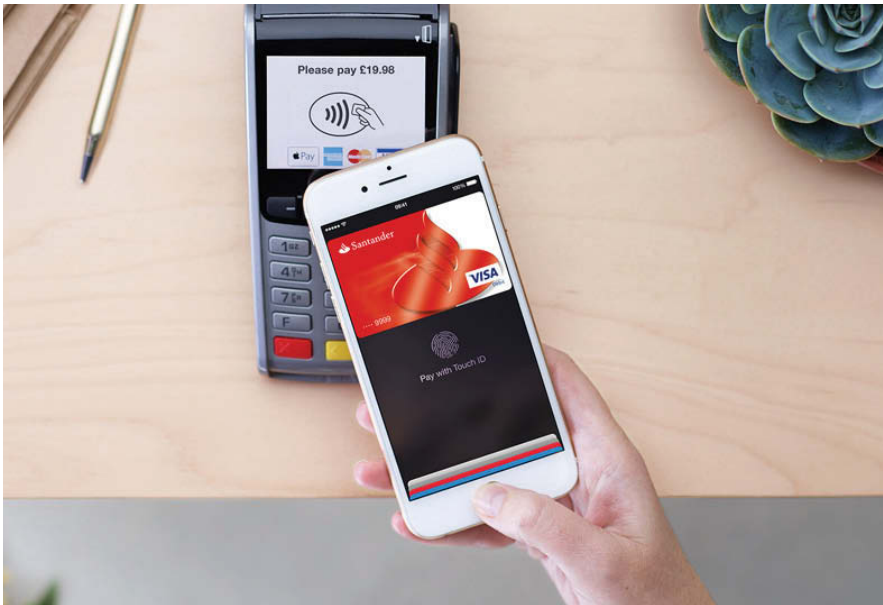


be able to get hold of your credit card details if they hacked your phone. And it's reportedly able to sense if someone is dismantling the phone in an attempt to access the data on the secure element.

It's also worth mentioning that Apple has a strong record when it comes to payment systems. Even the biggest payment platforms suffer compromises from time to time, but Apple has built up customer trust when purchasing through its iTunes and the App Stores.

Incidentally, Apple CEO Tim Cook pointed out that the system Apple Pay is proposing to replace isn't exactly super-secure itself, since it's easy to lose a credit card or have it compromised.

"This whole process is based on this little piece of plastic," he said. "And whether it's a credit or debit card, we're totally reliant on the exposed numbers and the outdated and vulnerable magnetic strip. Which, by the way, is five decades old. And the security codes, which aren't that secure."



As a security measure, the credit card details aren't actually stored on the iPhone, or on Apple's servers.

Apple says the payment network or issuing bank will provide a Device Account Number, using a technique called tokenisation: replacing a sensitive piece of data with a random piece of data that typically has the same format. Tokenisation reduces or removes the need to update existing systems that require a credit-card number, without exposing the real number to theft.

### If you are hit by fraud on Apple Pay, are you liable for any losses?

The situation should remain much the same as when using credit- or debit cards on their own. In its guide for merchants, Apple explains about fraud liability: "Will I [the merchant] be liable for fraud on Apple Pay transactions? Apple Pay transactions are treated in the same way as your current credit and debit transactions. You'll have the same liability rules applied to Apple Pay transactions."

Regulations in the UK dictate that cardholders are not held financially liable for any fraud on their cards, "provided you have not acted fraudulently or without reasonable care (such as, you haven't written down your PIN and haven't disclosed it to someone else)", and this will apply under Apple Pay, too.

Payments made using Apple Pay in a shop are classified as card-present

transactions, by the way. Payments made using Apple Pay within apps are card-not-present transactions. This has some ramifications in terms of liability if something goes wrong, but either way it shouldn't be you picking up the tab.

### UK retailers

Apple has boasted that Apple Pay will be available at more locations for its launch UK than it was for the US launch – and there some big names on the list. Marks and Spencers and Waitrose were two names that Apple picked out at the announcements – being, we'd guess, two brands that seem particularly British to an international audience – but Boots, Lidl, Starbucks, Subway,

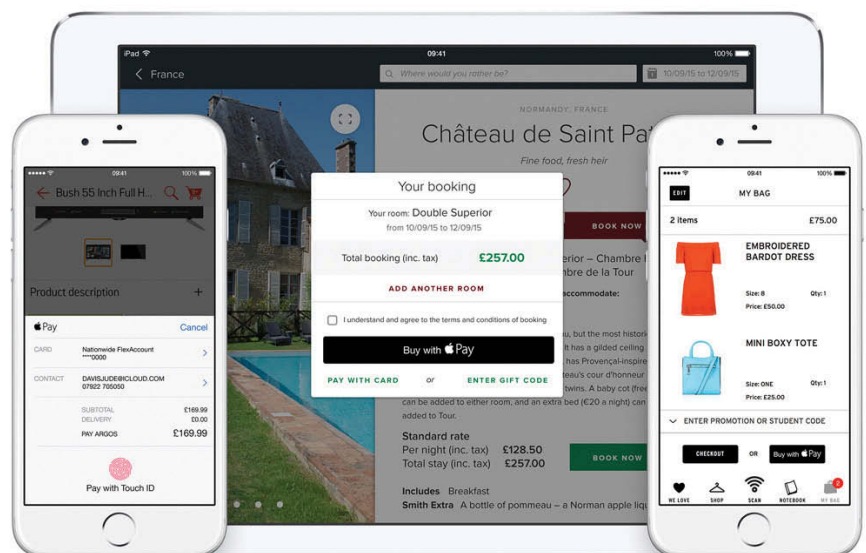
BP and Liberty are also on the list. Eagle-eyed readers will notice that Waitrose and Lidl, while recognisable names, are not the top names in the supermarket game, and it seems that Tesco, Sainsbury's and the rest are waiting to see how things go, or hedging their bets with other payment systems. We imagine that if Apple Pay is as popular here as it is in the States, they'll join up soon enough.

TfL (Transport for London) will support Apple Pay, too, so you'll be able to pay for Tube and bus journeys with your iPhone or Apple Watch.

### UK banks

Most of the big names have said they plan to join the service, although not all will be part of the scheme when it launches in the UK in July – Halifax, for example, expects to be part of Apple Pay around the autumn, even though it has committed itself to joining. We understand that American Express, First Direct, HSBC, NatWest, Nationwide, RBS, Santander and Ulster Bank will support Apple Pay at the UK launch in July. Bank of Scotland, Coutts, Halifax, Lloyds Bank, MBNA, M&S Bank and TSB will join at some point later in 2015.

The biggest name missing from the list is Barclays, which says it's still in negotiations about joining. It would be a surprise if it didn't join Apple Pay by the end of the year, but it's likely to be last to the party among the big UK banks.





# How to use Proactive in iOS 9

iOS 9's 'Proactive' feature will offer suggestions based on the apps you use most. Lewis Painter reports

If you're willing to allow it, Proactive will learn your habits throughout the day and offer relevant shortcuts to apps and functions based on your previous actions, as well as habits based on your current location. These shortcuts will be presented to you in the bottom left-hand corner of your iPhone/iPad's lock screen, a space usually reserved for Apple's 'Handoff' feature (which lets you use an app on your Mac and continue where you left off on your iPhone).

Proactive also embeds itself in the Search menu, which has reverted to its position to the left of the home screen, as it was prior to the iOS 7 update. For those of you that have got used to the pull-down Search menu, don't worry – this is still available too, but won't show Proactive categories by default.

## Contact suggestions

If you allow Proactive to monitor your habits, what kind of things can you expect it to do? For starters, it'll suggest contacts based on a number of factors – call/text frequency, location and even past habits. Let's say you always call your other half when you leave work to let them know you're on your way home. Instead of having to manually open the Phone app, select the contact and call them, you can instead swipe to the left of the home screen and access the Search menu.

You'll be presented with icons of frequently contacted contacts, with a similar look to how frequent contacts are currently displayed in the multitasking menu in iOS 8. Tapping on an icon reveals shortcuts to message, call or FaceTime (if applicable) them, as well

as an info button to open the contacts details in the Contacts folder.

Additionally, if you create an event invitation or email, Proactive will suggest contacts that you usually include with them. It bases this information on past events and emails with similar subject lines and event names, which both speeds up the overall process and makes sure that you haven't forgotten anybody.

## App suggestions

There are two ways in which Proactive can suggest apps for you in iOS 9. The first is via the Search menu – underneath your suggested contacts, you should see a line of suggested apps. These suggested apps are ones that are frequently used, and the list can be extended from four to eight suggestions



by tapping the 'More' option to the right of the screen.

However, we're far more impressed by its second method of suggesting an app. Let's say, for example, you always listen to music when you walk to work in the morning. As your iPhone learns your habits, it'll automatically start playing music when you plug your headphones in – but only at times when you usually play music. As well as this, it'll offer a shortcut to the Music app via a greyed out Music icon in the bottom left-hand corner of the lock screen.

It's not just limited to music though, it can be for any app – Craig Federighi gave an example during the WWDC 2015 keynote. He habitually meditates as soon as he wakes up in the morning, and showed his iPhone prompting him with a meditation app at the relevant time.

## News

As well as suggesting contacts and apps for you, Proactive also has another trick up its sleeve – news. Using your current location, iOS 9 will find the trending news stories in your area. This is accessible by swiping to the left of the home screen to access the Search menu, and scrolling down to the News subheading.

Four articles will be displayed by default, but more can be displayed by tapping the 'More' icon on the right-hand side. Featured articles (around our location in London) come from publishers including *The Independent* and Sky News. You'll be presented with its featured image, headline and the first three lines of the article.

Tapping on the article should open it in Safari, and you can quickly get back to the Search menu by tapping on the 'Back to Search' button that's displayed in the top left-hand corner whenever you open an app via Search.

We assume that once iOS 9 is officially released in the autumn that instead of linking to an article in Safari, it will open the article in Apple's newly announced News app. This Flipboard-esque app allows readers to create their own news stream based on topics and publications that interest them, and loads all articles in-app. However, until Apple launches iOS

9, we can't be too sure of its integration with the Search menu.

## Nearby locations

This feature will be a lifesaver for those of us that travel a lot. When you access the Search menu, you'll be presented with vividly coloured icons of nearby points of interest. These icons allow you to one-tap search for points of interest around your location such as car parks, petrol stations, and restaurants. Tapping on an icon will take you to Apple Maps, where you'll be presented with a list of nearby locations that apply to your search.

These results don't only include the name of the business, but also a star-based rating system, Yelp! reviews and distance to the location. You can also visually see the results, with a litter of Pins being dropped around your current location on the map. Tapping a pin will highlight the result in the list and will present an option to get either walking, driving or public transport (if in a supported area) directions to the location.

## Siri commands

Thanks to the new Proactive assistant, Siri has become a lot smarter and is able to do more than ever before. For example, if you went to New York City for a holiday, you could activate Siri and ask it to: "Show the photos I took when I was in New York City". You should be presented with the photos you were looking for. How's this done? Siri searches through your photos and bases its results on dates, locations and album titles.

That's not all Siri can do either; it can also remind you about things you're looking at in your apps at a later date. If you've found a new restaurant in Apple Maps that you want to check out later, you could say "Remind me to check out fuel when I get to my car" or if you're half way through writing a document in Pages and need to stop, you could say "Remind me to carry on with this tomorrow".

## Intelligent Search

The combination of Proactive and Siri in iOS 9 doesn't only result in suggestions and an improved Siri, but it also results in a much-improved search utility. Prior to

iOS 9, your search results would include Wikipedia entries, Bing search results and App Store search results in addition to the standard contact, message, email and note results.

With iOS 9 you'll be able to search for much more. So, for example, you could hunt for sports scores and schedules, allowing you to look for the latest Arsenal score instead of asking Siri to find it. You'll also be able to search for the weather in any location around the world, see the latest Stock prices and carry out calculations and conversions.

However there's one other feature of the intelligent search that we can't wait to use. If developers add support, you can search for keywords in third-party apps. This means that if you have a recipe app installed on your iPhone, you could search for "sticky toffee pudding" and the search results will display the recipe, directly from the app.

## Smart caller ID

We can't be the only ones that hate answering calls when we're not sure who's calling, right? Well Apple has decided to address this issue in iOS 9 with a smart caller ID. How does it work? Whenever you get a call from a number that isn't stored in your contacts, iOS will search through your emails to find a possible match. If a match is found, the sender's name will be displayed underneath the number.

But what if you don't have the number in any emails? Not everyone emails first, so don't expect to get a heads up about those annoying PPI calls. However if the caller is calling from a landline, the origin of the call will be displayed underneath the number, giving you a better idea of who the caller could be.

## Get the most out of Proactive

So, the question is "How do I get the most out of Proactive in iOS 9?" and the simple answer is to use your iPhone or iPad as often as possible. Proactive becomes more accurate and useful the more it learns your habits, so by using your device as much as possible, it allows iOS to get to know you (so to speak) and should make your life a little easier.

# Alternatives to iTunes

Craig Grannell reveals how to eradicate iTunes from your life, and whether or not you should

If you're a fan of iTunes this article probably isn't for you. Instead, we're asking whether you can eradicate iTunes from your life and if you really should. If you're dead set on ditching iTunes, you'll probably need to invest in some other apps and services to take over the tasks iTunes performs. However, we also think there's one thing that should stop you binning Apple's app entirely (which will require a 'skip to the end' if you hate being kept in suspense).

## Alternatives to iTunes for music on Mac or PC

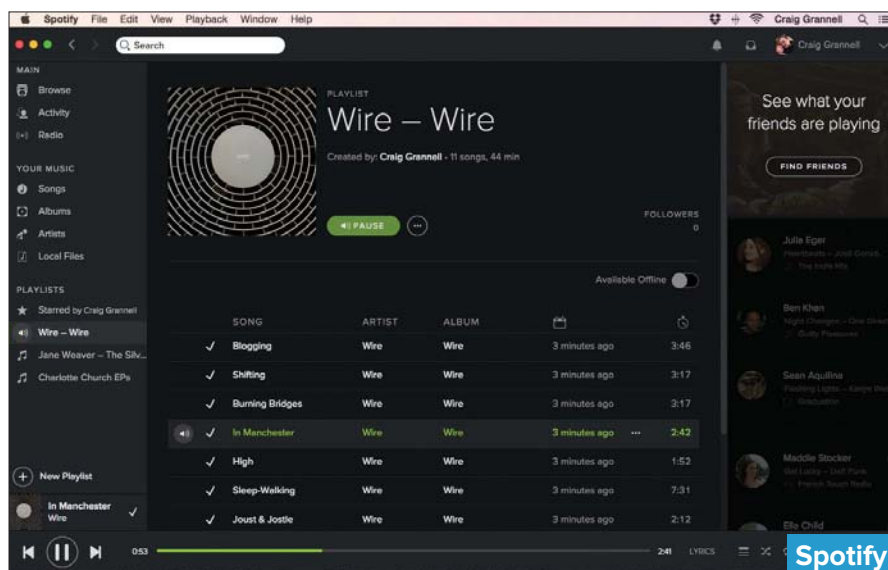
Although iTunes has come a long way from its 'digital jukebox' origins, music playback remains the main reason many people have it installed. And with iTunes being free, competing apps find the going tough. This is probably why many products (such as Ecoute) have been abandoned.

However, alternative players still exist, including Swinsian and Vox. Both of these focus on music, import your local files, and support a wider range of formats than iTunes, including FLAC.

Another option is to ditch local music and use cloud-based playback (such as Amazon Music or Google Play), or a streaming service such as Rdio or Spotify. For our money, Spotify is the best choice, with the largest catalogue, a reasonably good native OS X app, and the option to integrate your local music files.

## Alternatives to iTunes for music on iPhone and iPad

On iOS, things are more complicated, due to the system's relatively closed nature. The Music app heavily integrates with iTunes, and it's not just a case of dragging and dropping audio files from



your Mac to your device. Apple assumes that you'll be syncing purchased or ripped music using iTunes or relying on Apple's cloud services.

If you've already set up iTunes Match, you'll be able to access your entire music collection on an iPhone or iPad, without needing iTunes itself, and you can also download subsequent and previous iTunes purchases directly to your device.

The online-oriented products mentioned for the Mac also exist for iOS; again, Spotify's probably your best bet, and has a modicum of integration between devices, so you can use your iPhone to control Mac playback.

Softorino's Waltr is an option for people who prefer owning actual music files, including high-res FLACs, rather than subscribing to streams. The app is straightforward: connect your device to your Mac via a USB cable, and drop the audio files you wish to add to Music on to Waltr. They will then be, where relevant, converted to a format compatible with iOS, and sent to your device.

## Alternatives to iTunes for TV, movies, podcasts and books

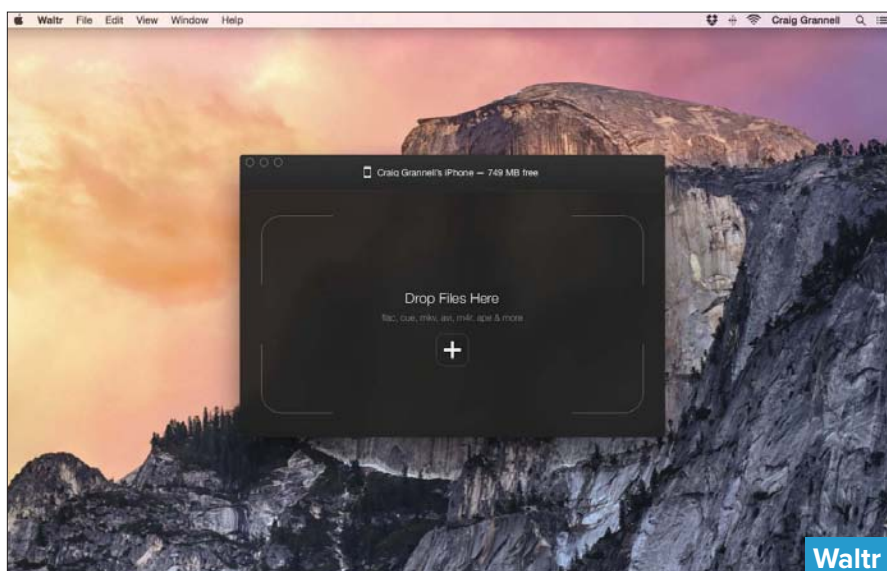
With other media, what you need to do depends on what you used iTunes for. Regarding books, iBooks is on OS X and iOS alike, and so you don't really need iTunes for dealing with reading material.

As for managing and playing back podcasts, iTunes isn't especially great anyway, and nor is the Podcast app, so consider checking out Instacast and Downcast, which both have OS X and iOS incarnations, or Pocket Casts, which has an iOS app and browser version.

For video, if you're a fan of iTunes Store purchases and use your Mac to play them back, you should probably stick with iTunes anyway. If you've largely just used Apple's media player to store and sync iOS-compatible videos, there are plenty of alternatives. The aforementioned Waltr, for example, will happily convert video and fire it at the native iOS Videos app. We also rather like StreamToMe and Air Video HD, which work with a free Mac- or PC-based server app to access video files, and encode them on the fly for your device.

This means you don't even have to sync anything – you can just watch your videos whenever you have connectivity. The caveat: these apps don't work with

If you've already set up iTunes Match, you'll be able to access your entire music collection on an iPhone or iPad, without needing iTunes itself



videos that have DRM (such as iTunes Store purchases). And then, of course, there are countless streaming services for TV and video that you can install on your devices that don't need iTunes, such as Netflix, Now TV and BBC iPlayer.

### Alternatives to iTunes for managing apps and backing up

iTunes can be used for downloading apps and syncing them to a device, and also for rearranging your Home screens. Doing so is unnecessary, though; you can easily download new apps directly on a device. To then install on another device, just open the App Store, ensure you're signed into the same iTunes account, and head to the Purchased tab (found inside Updates on iPhone).

One area in which iTunes can come in handy is for bulk-deletion. Deleting even a single app can take time on iOS, since devices have a tendency to lock up while you wait for a 'delete' dialog box. With iTunes, you can deselect several apps and get rid of them in one go.

You can now also do this with PhoneExpander. The app scans your device, and enables you to order apps by size; you then click checkboxes and a 'Remove' button to get rid of a number of them in one go. (The app also provides tools for clearing photos and messages.)

In a more general sense regarding back-ups, iOS devices can optionally be backed up to iCloud (*Settings* → *iCloud* → *Backup*), with the caveat that

you must have enough free space. In *Settings* → *iCloud* → *Storage* → *Manage Storage*, you can check device back-up sizes against your iCloud storage plan, and for the current device optionally turn off certain components if necessary (such as Camera Roll).

Note that anything you disable won't be recoverable if you need to restore a device, though. This is the main reason why although we're happy to recommend alternative software to help minimise iTunes usage, we won't suggest getting rid of the media player entirely. iTunes should remain on your Mac for making periodic local backups of devices – especially before iOS upgrades. (Select your device and in the Summary pane, click 'Back Up Now' to back it up.)



### Uninstalling iTunes, and changing your mind

If you're unrepentant and want shot of iTunes entirely, it's possible. Try to trash it in OS X Yosemite and a warning dialog will grumble that iTunes "can't be modified or deleted because it's required by OS X", which is a bit of a stretch. So in Terminal, enter the following commands:

```
cd /Applications sudo rm -R iTunes.app
```

Enter an admin password, hit Return and the iTunes app will be gone – for all users. To eradicate even its support files, Alt-click 'Go' in Finder and open your Library, and then delete the iTunes folder, along with instances of com.apple.itunes\* in Preferences and Preferences/ByHost.

At this point, someone might suggest that you're being a smidge obsessive. Should you wish to press on, related data files can be removed, too – device back-ups live in ~/Library/Application Support/MobileSync/Backup, and media files lurk in ~/Music/iTunes. Make sure that you really don't want these before deleting them!

And if you've got to this point, broken out in a cold sweat, and screamed "I have made a mistake", you can grab a copy of the latest version of iTunes from [itunes.apple.com](http://itunes.apple.com). Although we'd suggest not deleting your media folder before that point, or you won't have a lot to play – or will have a lot of downloading to do.



# How to improve audio quality

Craig Grannell explains how to get the best quality audio on your iPhone, iPad and iPod

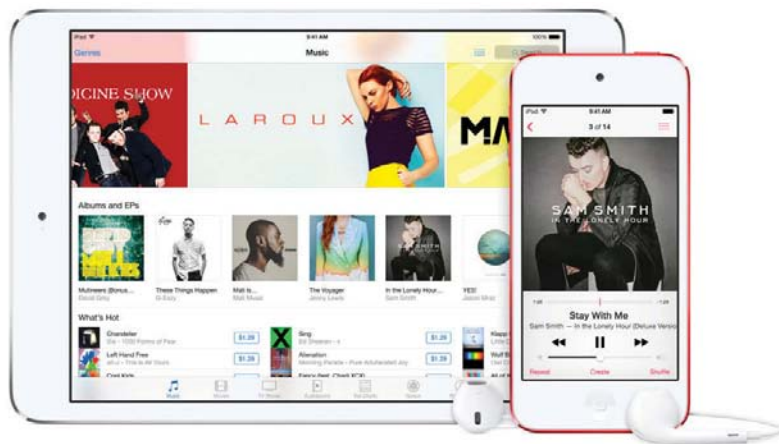
There's a lot of fuss these days about high-end audio. In the US, for example, Neil Young is still trying to convince people to part with \$400 for his triangular music player Pono, which he argues will make your ears squeal with glee on experiencing it. The Pono store and others are selling so-called high-resolution audio files, which they claim better more typical downloads in closely resembling what studio recordings intended. And even streaming services are getting in on the act, taking advantage of high-speed internet to deliver less compressed music.

But what if you're perfectly happy with your iOS device, and don't really fancy buying a separate player for audio, and then pretending it's October 2001? What can you do to improve your experience playing music on your iPhone or iPad?

## Audio files

The simplest way is to change the music format you use. Audio can be lossy or lossless. Compressed lossy files (such as MP3 and AAC) have long been the norm in digital. In essence, they approximate a raw music file, attempting to discard 'irrelevant' data that people cannot hear, resulting in a smaller file size, but losing information along the way. This is similar in nature to how you can take a high-res scan and then turn it into a compressed JPEG. The trick is in finding the right balance between file size and ensuring that the original content isn't degraded to the point differences in quality are overly noticeable.

When ripping CDs in iTunes, the Import Settings within General Preferences determine the encoding used. Options include MP3, AAC, AIFF and Apple Lossless (ALAC). AIFF will result in files that sound identical to the original source, but these will be huge: about 10MB per minute. On a Mac with a boatload of storage, this might be okay, but mobile devices are more limited. Unless you only want a tiny selection of music on your



iPhone, AIFF is not a good bet. Apple Lossless is compatible with the iOS Music app and will generally take up about half as much space, but sound identical to the original CD. It's a better bet.

But do not entirely dismiss compressed lossy audio. Using the iTunes Import Settings dialog, you can fine-tune the level of compression for these formats when CDs are ripped, matching iTunes Plus for AAC (256kb/s, although you can go higher) or setting the bitrate of MP3 all the way up to 320kb/s. Even at their maximum settings, the resulting files will be significantly smaller than AIFF and Apple Lossless. However, at higher bitrates, which discard less information, the vast majority of people won't be able to hear any real difference between AAC/MP3 and the original CD source.

## Where to buy the best audio quality, high res audio downloads

Another thing to bear in mind is where you download music from, if CDs are something you consider should be consigned to history. iTunes sells 256kb/s AAC, and 320kb/s MP3 is commonplace elsewhere online. However, if you bought or downloaded MP3s many years ago, they may be at a much lower bit-rate (128kb/s, say); while most people find it difficult or even impossible to tell the difference between modern iTunes Store downloads and CD audio, 128kb/s removes too much of the original data

and can sound noticeably muffled, compressed, tinny, or just plain bad.

Where possible, get newer versions of your files. If you've got a ton of them, consider buying iTunes Match for a year. There are tutorials online about how you can match (an admittedly fairly well organised) iTunes library, delete your local files, and then replace them with new 256kb/s AAC from Apple. For new purchases, 'Mastered for iTunes' recordings have gone down well even with relatively picky audiophiles.

Alternatively, experiment with purchasing higher-quality audio files from sites that offer formats such as FLAC (Free Lossless Audio Codec) rather than just MP3. Note, though, that iOS devices do not support this format by default, and nor does iTunes. Depending on how you'd like to manage such files, you can either convert FLAC downloads to Apple Lossless using something like X Lossless Decoder, or use apps such as Vox Player, FLAC Player+, and CanOpener for directly playing back FLAC on iOS devices.

As noted earlier, some online music stores now plug high-resolution files, which claim to go well beyond even CD audio, although, when you look into it, also beyond the limits of human hearing. You'll see music listed as 24/96, which means 24-bit/96kHz. By comparison, CD audio is 16-bit at 44.1kHz. A larger bit depth results in higher potential dynamic range capture within a specific slice of

time, while the frequency refers to the sample rate — the slices of audio captured per second. So 96kHz audio is sampled more than twice as much per second as 44.1kHz audio.

Naturally, the assumption with bit depth and frequency is that larger numbers are better. One thing they certainly are is larger, and this extends to file sizes. If you thought Apple Lossless, FLAC and AIFF audio files were big, high-resolution audio equivalents will seem gargantuan; single albums can easily clock in around the 1GB mark. The snag is 16-bit audio deals ably with what people can hear, and so it's hard to make an argument in favour of higher-resolution audio at the best of times, let alone when you're dealing with mobile devices that have limited storage. (Additionally, there's plenty of discussion online whether even the iPhone 6 and 6 Plus can output high-res audio through their headphone ports, which rather puts a dampener on everything unless you stick an external digital-to-analogue converter between your device and headphones. Not very handy when you're out and about, getting on with your day.)

Therefore, when purchasing music we'd say FLAC and Apple Lossless is a good yardstick to aim for, or AIFF/WAV if you're feeling a bit paranoid about lossless compression. Sites such as Bandcamp often give you the option of which format or formats to download, so you can always grab the MP3 or AAC for your iPhone and FLAC or Apple Lossless for future-proofing. But leave overly expensive high-res audio for the people who claim buying £1,000 cables and 'risers' for speaker leads makes their music sound like unicorn tears caressing their ears. Also, if you're into streaming rather than buying, consider the likes of Tidal over Spotify, but again be mindful that on your mobile device, you might not be able to hear the difference between the former's 1411kb/s streams and the latter's more compressed audio.

### Get better headphones

Beyond ensuring you're not trying to play audio compressed so heavily, it sounds like it's coming from a transistor radio

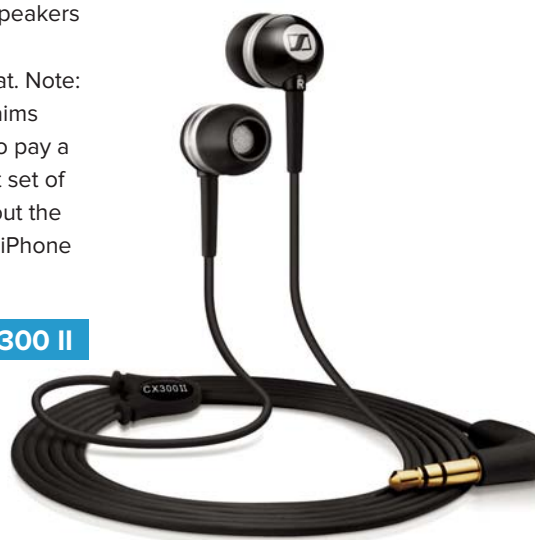
someone threw in a hedge in a garden half a street away, the main difference you can make in improving your iOS audio experience is purchasing new headphones. The ones that come with the iPhone and iPod touch aren't bargain-basement, but they are merely fit-for-purpose in covering the basics. They're fine for calls and okay for music, but far from great.

Even twinning a £30 pair of Sennheiser CX 300 IIs (pictured) with reasonably high-quality lossy audio will greatly improve what's going into your ears. To a point, though, you get what you pay for, at least up to a few hundred pounds, and so if you can budget a bit more for headphones, your inner audiophile will be happier.

Note that the type of headphones you go for will also impact on audio quality. Over-ear headphones tend to be better than earbuds, although they're of course significantly bulkier. Bluetooth wireless headphones have improved a lot in recent years, but still tend to offer inferior sound quality than wired equivalents, and for a higher price.

In a home setup, you'll again find spending a bit of money helps improve the sound coming out of your device. Often, small speaker docks offer mono rather than stereo output and are essentially the speaker equivalent of cheap earbuds. More expensive speakers designed for mobile can be better, but you must still remain mindful of those only capable of outputting a compromised signal when it comes to the stereo image. When possible, consider buying a hi-fi amp and speakers or a home or office system and connecting your iOS device to that. Note: don't get taken in by snake-oil claims regarding cabling; it's one thing to pay a few hundred pounds for a decent set of speakers, but anyone splashing out the same on a cable to connect their iPhone to their amp is a mug.

Sennheiser CX 300 II



### The final word

This guide is a starting point. There are countless pieces of kit and countless opinions about how you should experience audio. It's a very subjective field, and so we'll finish with a few thoughts. First, don't feel bullied into buying a lot of kit because you think you should. Secondly, where possible try 'blind' tests, to check different headphones and speakers out on music you enjoy. You may find a £50 pair of headphones is fine and – to your ears – no worse than the £200 pair. Similarly, do some blind tests on file compression, because there's no point in re-ripping your entire music collection to Apple Lossless and desperately cutting down the albums you can store on your iPhone if it turns out you can't tell the difference between such files and the same music encoded as 256kb/s AAC.

Also be mindful that a lot of modern music is mastered in a manner that means a lot of nuance has been lost, regardless of the technology you throw at it. (Do a web search for 'loudness war' for more information.) Things are slowly changing, but no amount of careful ripping and perfect headphones will save recorded audio designed to punch your ears in. And finally, realise that compromise is inevitable to some extent when dealing with mobile. iOS devices are limited in terms of storage and technology, and so your aim shouldn't necessarily be the best audio experience ever, but one that you consider good enough for the effort you make and the financial outlay you can happily afford.



# Set up Family Sharing in Photos

If you've taken a bunch of pictures that you'd like to share, Lesa Snider reveals how to do so in Photos

If more than one Mac- or iOS device-using person lives under your roof – or if you share your Mac with one or more people – using Photos in a family situation can be a complicated affair. Because you can't share Photos libraries across a network, you quickly end up with multiple libraries (one for each Mac user account) and nobody remembers which pictures live where. It's a nightmare; but fortunately, Apple has a solution.

## Meet Family Sharing

Family Sharing enables you to create a special group that you invite family members to join. The end result is a shared album named Family that everyone in the group can access (and it can't be shared with anyone outside the group). Family members can easily add or remove their own pictures and videos, which are viewable and downloadable by everyone in the group. This album is also accessible on the web; just visit iCloud.com and sign into your iCloud account to see all the goodies it contains.

With Family Sharing, each person maintains his or her own Photos library

and gets to choose what's shared with everyone else. This gives each member some level of privacy while you, Family Commander-In-Chief, have access to shared items and can download them into your own library in order to include them in projects such as books, calendars, and cards

It's a great long-term solution, too. For example, as family members get additional iOS devices, their own Macs, or they move away, their unique Apple ID ensures that all their pictures, videos, emails, and so on migrate to the new

devices. Plus they can continue to share digital proof of their adventures, even from far away.

And that's not all; the Family album is just one of several services that you can share among the members in your group. Other services include a shared Calendar, purchases from Apple's App store, iBooks store, and iTunes store, and tracking the locations of Macs and iOS gadgets.

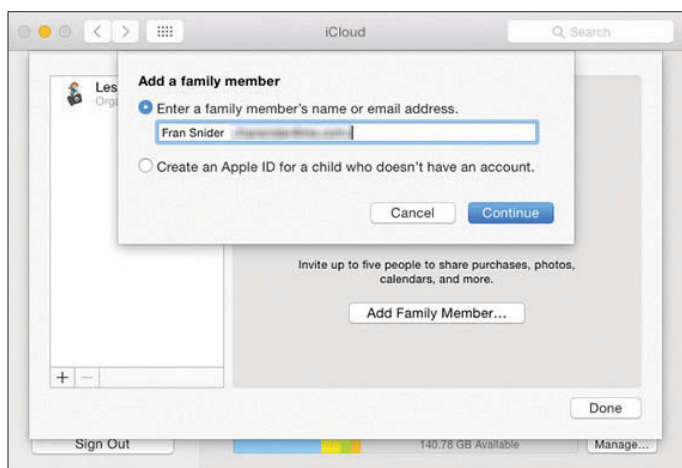
## How to set it up

**User accounts:** If you haven't done so already, set up each person with their

**You can invite** up to five people to join your group, though you must invite them one at a time.







**You can invite** up to five family members to join your group using the iCloud preference pane shown here. This same pane also lets you create an Apple ID if you don't have one already.

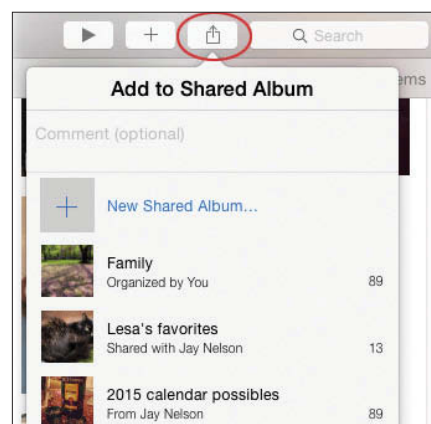
Apple also adds a Family category to the Calendar and Reminders apps.

## Start sharing

Anyone in your family group can now add pictures and videos to the album, though it's easiest if you turn on the sidebar, which is like iPhoto's source list. Choose **View → Show Sidebar** and then drag thumbnails from the preview area into the Family album. The new content immediately appears in the Family album on the other group members' devices.

It's important to remember that shared items don't live on your hard drive (that is, unless you shared them). If a family member wants to edit or include a picture or video in a project, you need to download it from the Family album into your personal Photos library. To do it, drag the thumbnail(s) onto the Photos entry at the top of the sidebar or into an album in the Albums section of the sidebar. You can also Ctrl-click the selected thumbnail(s) and choose **Import** from the shortcut menu that appears. Either way, the item now lives in your Photos library.

Now you can sit back and enjoy the fruits of your family sharing labours. Remember though, this isn't the way to share content with just anyone. As you recall, you entered a credit card that's now shared by all the family members in your group. To share goodies with those you aren't financially responsible for, use regular iCloud shared albums instead.



**Alternatively, you can** select some thumbnails, click the share icon in Photos' toolbar (circled), choose iCloud Photo Sharing, and then choose the Family album from the resulting list.

own user account on the shared Mac so they get their own Photos library, email, iCloud document storage, and so on.

**Apple IDs for everyone:** If any of your family members lack an Apple ID, go online and sign up. Bear in mind that an Apple ID is automatically created when someone purchases an item from Apple.com or you turn on iCloud services on a device running iOS 5 or later, so check for existing accounts.

**Create a Family Group:** You can perform this on your Mac or on your iOS device. On a Mac, go to **System Preferences → iCloud**. In the resulting pane, click **Set Up Family**, and then follow the onscreen instructions. To set up family sharing on an iOS device, tap **Settings → iCloud**. On the next screen, tap **Set Up Family Sharing**, and then tap **Get Started**. Because Family Sharing extends beyond sharing pictures and videos and into the realm of iTunes purchases and so on, you're prompted to enter a credit card.

**Invite people to join the Family Group:** Now that you have a Family Group, you can invite family members to join it. On a Mac, go to **System Preferences → iCloud** and click **Manage Family**. Click **Add Family Member** or click the '+' button at the lower left and then follow the onscreen instructions. On an iOS device, go to **Settings → iCloud → Family → Add Family Member**.

You'll need each family member's email address. When you've finished

entering the first address, click **Continue**. If you entered an email address associated with the person's Apple ID, the next pane lets you enter their Apple ID password or, if you don't, you can trigger an email invitation.

Your invitation winds up in the recipient's email inbox. Once they click the big blue **View Invitation** button in the body of the email, the Family Sharing preferences pane springs open and lists all the slick things they can do — share purchased music, movies, apps, and books; share pictures and videos; and share events on a family calendar.

Next, your recipient will need to click **Accept**. If the person belongs to another family group, a message appears stating that they have to leave that group before joining another one. Your recipient can click **OK**, and then use the preference pane that appears to extricate his or herself from the other group. (Apple limits you to being a member of only one family group, and you can only switch family groups once per year.)

To check whether your family sharing invitation has been accepted, in the iCloud system preference and select **Manage Family**. Select a person's name to see the status of their invitation. If you need to resend it, select **Resend Invitation**. To check your invitations on an iOS device, tap **Settings** and in the iCloud pane, tap **Family**. If necessary, you can resend an invitation from there. No matter what, Photos automatically creates a new album named **Family** in Shared view.



# How to set up Photo Stream

It's easy to see your photos on all your Apple devices using Photo Stream. Martyn Casserly shows how

**A**pple's My Photo Stream is an excellent way to manage and view your photos on all your devices. The automatic service syncs all your Apple devices using iCloud, meaning that your photos appear on your iPad, iPhone and Mac without the need to plug in a cable or send anything via email. You can view the past 30 days of photos on any device. In this tutorial, we show you how to set up My Photo Stream.

My Photo Stream can be used without turning on iCloud Photo Library, which would allow you to share more photos but has an associated cost.

## 1. Create an iCloud account on your Mac or iOS device

For Photo Stream to work you'll need to have an active iCloud account. Usually you'll create this when setting up a new machine, but if you skipped that part it's easy and free to open one now on your Mac or iOS device.

On your Mac, click on the System Preferences icon in the Dock, then select iCloud and enter your Apple ID. You'll be

given a few settings to enable, just make sure you click on Photos and ensure the My Photo Stream box is ticked.

To create an account on an iOS device, go to Settings, iCloud, and enter your Apple ID.

## 2. Enable iCloud in iPhoto

Now you'll need to give applications permission to use it before any photos will be able to download. Launch iPhoto on your Mac and look in the left-hand column where you'll find the Library, Recent and Sharing categories. Under the latter is iCloud. Click on this and then select the Use iCloud option.

If you've updated to the latest version of Yosemite, you'll find that there is a new icon in your Dock that looks just like the Photos icon on your iPhone. That's the new Photos app that replaces both iPhoto and Aperture. Launch it and if you want to set up just My Photo Stream and not iCloud Photo Library, click skip when Apple asks you to sign up. Now, go to *Photos* → *Preferences* in the navigation bar at the top of your screen, and click iCloud, then tick My Photo Stream.

## 3. Enable Photo Stream on your iPhone

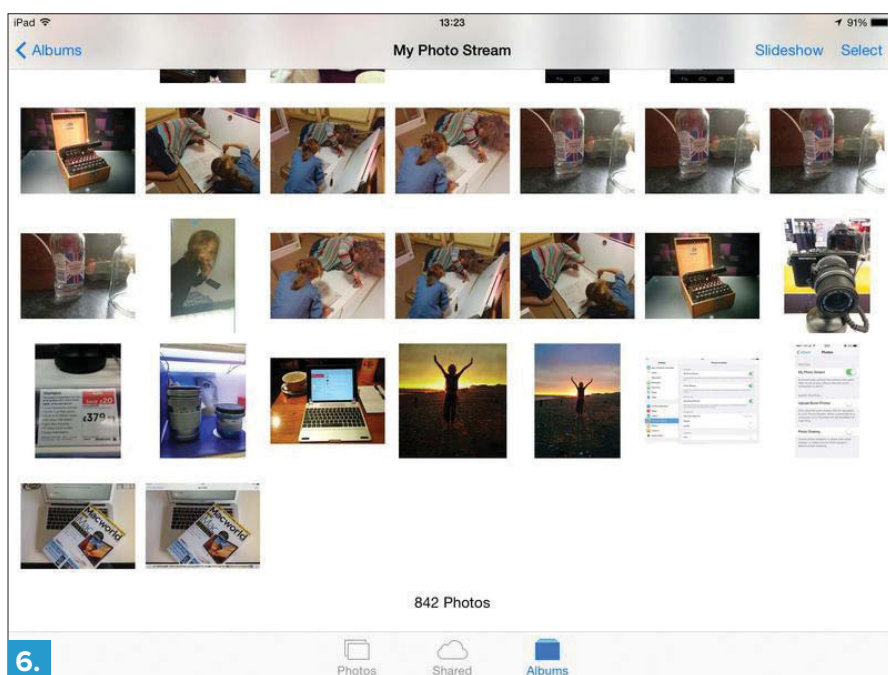
As the iPhone is likely to be the device you use most for photography, having a working Photo Stream is important. To do so, you'll need to go to Settings, then iCloud, then Photos. Here, you'll want to make sure My Photo Stream is turned on.

If you own one of Apple's newer iPhones, you may also see the Upload Burst Photos option, which will transfer only your favourite photos from Burst Mode if you enable it.

This is something we'd recommend, otherwise your library would be swamped with duplicates of the same image.

## 4. Enable Photo Stream on your iPad

As the iPad is running the same software as the iPhone, the setup is pretty much identical. The one omission is the Upload Burst Photos option because this is a feature the iPad doesn't have yet. To enable Photo Stream, go to *Settings* → *iCloud* → *Photos* and then ensure that the My Photo Stream button is green.



## 5. Take a picture to see how it works

With your iPhone or iPad, take a picture of something. Next, go to the Photos app on your Mac (or iPhoto if you're still using it) and, as long as you're connected to Wi-Fi, you should see the photo arrive shortly after you snapped it on your iOS device.

## 6. How many pictures can Photo Stream store?

While Photo Stream is very easy to use, understanding how the storage works can be a little more challenging. You are entitled to 1,000 photos, which is a large amount, and none of these count against your iCloud storage. One thing to note though, is that the images are only held on the iCloud servers for 30 days, so if you want to back up iPhone photos on your Mac don't forget to download them.

## 7. Sharing a screen

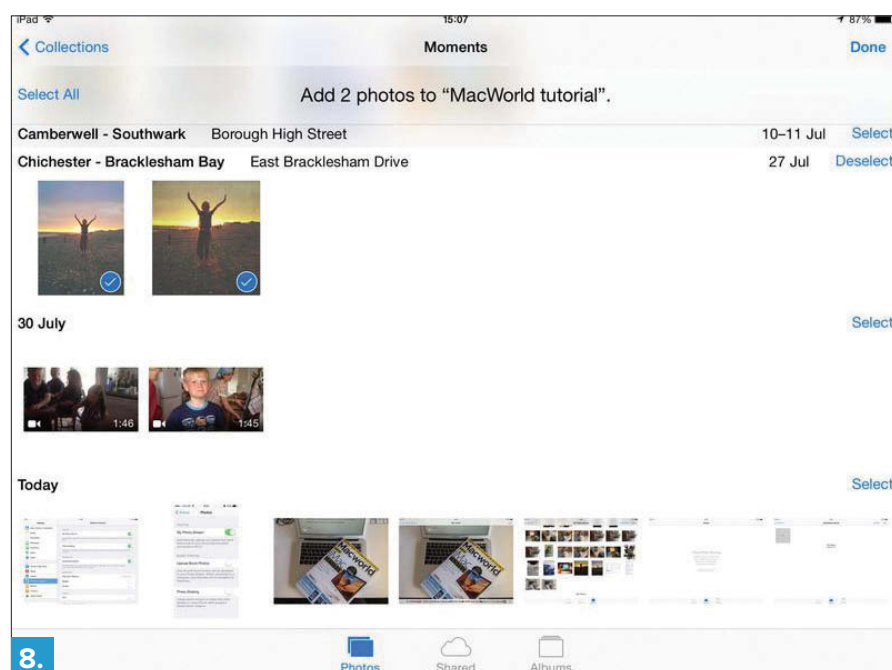
First off, you'll also need to check that Photo Sharing is enabled by navigating to *Settings* → *iCloud* → *Photos* on your iPhone or iPad and switch on iCloud Photo Sharing. Then go to the Photos app on your device and tap the Shared icon at the bottom of the screen. After the library has updated, you'll see the option to Create New Stream. Tap this, name the Stream, and then add the contacts you wish to share your photos with.

Bear in mind that the recipients will need to have Apple IDs and iCloud accounts to access the Stream.

Now tap Create and your Stream is ready. You can create multiple Streams and add different photos in each.

## 8. Adding photos

Tap on the Stream name you've created and you'll see the folder is empty. To remedy this tap the plus box in the top left corner then select the photos you wish to share in the Stream.



You can do this individually or tap on the Select option on the right, which will highlight all the images in that particular group. When you're happy, tap Done, add a note if you want to, and the Stream is now accessible to those you invited.

## 9. Photo Stream in iOS 8 and Yosemite

With iOS and OS X Yosemite, Apple updated the photo features on iOS and Mac, and you might want to investigate using iCloud Photo library.

The 1,000-photo iCloud sync limit is replaced by an all-encompassing iCloud Photo Library. You can keep your photos on your iPhone locally and continue to use Photo Stream as described in iOS 8, or you can use the iCloud Photo Library.

If you enable it, any photo or video you shoot will be automatically uploaded to iCloud. That content will be stored at its full resolution and in its original format. All of those images will be viewable on any of your iOS devices or on the web, as well as in the new Photos app on your Mac.

You'll get 5GB of storage space for free as part of your iCloud account, and you'll be able to buy 20GB for 79p per month or pay £3.49 per month if you want 200GB.

Having your library synced and backed up to iCloud is a great way to keep images safe and make them accessible.



# Complete guide to Apple devices

EVERYTHING YOU NEED TO KNOW ABOUT MACS, IPHONES, IPADS, IPODS AND OTHER APPLE PRODUCTS

Welcome to *Macworld's* in-depth guide to every Mac, iPad, iPhone and iPod that Apple makes, as well as other hardware and software that comes out of Apple's HQ in Cupertino, California. The first two pages offer a quick summary, with detailed looks on the following pages.

Apple makes six different kinds of Mac, and each has subcategories and variations in specs and features. Some Macs are faster and more

powerful, while other Macs have slower processors but are cheaper. This guide should help you identify which Mac best suits your needs.

There are now four different iPhones and five iPads to choose from, along with a collection of iPods and the Apple TV. Plus, we should soon see the launch of the Apple Watch. Read on to understand every product that Apple makes.

## MacBook Air **MARCH 2015**

The MacBook Air is Apple's ultrathin and incredibly light laptop, sometimes referred to as an ultrabook. It comes in two screen sizes, 11in and 13in. Apple's cheapest MacBook Air costs £749. The range was updated in March 2015.



## MacBook Pro **MARCH 2015** **MAY 2015**

There are two types of MacBook Pro available: one with a high-resolution Retina display and flash storage; and a simple version, which is the only Mac to feature a CD/DVD drive (the model hasn't been updated since 2012). There are two screen sizes of MacBook Pro Retina available: a 13in and a 15in. The 13in was updated in March 2015, and the 15in in May 2015. It is more powerful than the MacBook Air, but the prices are a lot closer than they used to be. The cheapest MacBook Pro costs £999.



## Mac mini **OCT 2014**

The Mac mini is a compact desktop computer measuring less than 20x20cm and is Apple's cheapest Mac, starting at just £399 – the same price as a 16GB iPad Air 2. It features an HDMI port, which makes this computer a popular option for a home media centre as you can plug it directly into your TV screen.

## Mac Pro **DEC 2013**

The Mac Pro is Apple's professional Mac with a price tag to match – it starts at £2,499. It's a fully fledged workstation aimed at those who need the ultimate in power.



## iMac **OCT 2014** **SEPT 2013** **MAY 2015**

The iMac is incredibly thin, with the whole computer concealed behind the gorgeous display. There are two different sizes of iMac available: the 21.5in and the 27in. The cheapest iMac costs £899. A new £1,599 Retina Mac has joined the flagship 5K Retina Mac introduced in October 2014.



## MacBook **APRIL 2015**

This is Apple's newest Mac. It's built more for style and portability than for the practicalities of computing – it has only one port and a basic processor – but it does have a Retina display, and it does come in gold, silver and space grey, just like your iPhone. This new Mac model went on sale in April 2015.



### iPad Air **OCT 2014**

The iPad Air is Apple's biggest tablet. There are two models, both with a 9.7in Retina display: the original iPad Air, launched in 2013, and the iPad Air 2 with Touch ID, released in October 2014. The newer model is thinner, faster and more powerful, and there is a gold finish available as well as the original black and silver variants. The older iPad Air costs £319 (16GB) or £359 (32GB).

The iPad Air 2 costs £399 (16GB), £479 (64GB) or £559 (128GB). You can buy an iPad with just Wi-Fi or with Wi-Fi and cellular coverage – add £100 to get the price with cellular coverage.



### iPhone 6 Plus **SEPT 2014**

The new iPhone 6 Plus is Apple's first phablet-style phone. Phablet is the name used for phones that are so big that they are like small tablets. The



iPhone 6 Plus has a 5.5in screen, so it's really not very much smaller than the iPad mini. In addition to the bigger, better screen, the iPhone 6 Plus comes with a better camera than the iPhone 6. Prices start at £615 for the 16GB version; the 64GB version costs £699 while the 128GB iPhone 6 Plus costs £789.

### iPhone 5s **SEPT 2013**

The 5s is the iPhone that Apple introduced in September 2013. It's available in gold, silver or grey and has a Touch ID button allowing fingerprint scanning for security, rather than the older-style home button with a square in the middle. The Touch ID button is the most obvious difference. Apple is now selling only 16GB (£459) and 32GB (£499) models of the iPhone 5s.



### iPad mini **OCT 2014**

Apple sells three different iPad mini tablets. There's the original iPad mini, first launched in 2012 and now available for £199 (16GB). There is the iPad mini 2, launched in 2013, which costs £239 for the 16GB version, or £279 for 32GB.



And there is an iPad mini 3, launched in October 2014 and starting at £399 for 16GB, £399 (64GB) and £479 (128GB). All three models are of a similar size with 7.9in screens. The original iPad mini lacks a Retina display, and only the iPad mini 3 offers Touch ID. Like the Air, you can pay £100 more to get a cellular version so that you can surf using 3G or 4G.

### iPhone 6 **SEPT 2014**

The iPhone 6 has a bigger screen than the iPhone 5s: 4.7in (measured diagonally, corner to corner) compared to the 4in of the 5s. The iPhone 6 is also thinner and lighter than the previous year's model. Like the iPhone 6 Plus, the iPhone 6 also comes equipped with a better A8 processor and an NFC chip for mobile payments. It costs £539 (16GB), £619 (64GB) or £699 (128GB).



### iPhone 5c **SEPT 2013**

The iPhone 5c has a polycarbonate (plastic) shell that is available in six bright colours. Apple released the iPhone 5c alongside the iPhone 5s in September 2013. On the inside the 5c is pretty similar to the iPhone 5, although the camera on the 5s is a better model. Apple sells an 8GB iPhone 5c for £319.



### iPod **SEPT 2012**

When Apple introduced the iPod in 2001, it started a revolution that eventually ushered in the iPhone and the iPad. The original iPod is now long gone, and the company no longer sells the iPod classic, which was most like the original. However, you can still buy a number of different iPods. There's the iPod touch (from £159), which is as close as you can get to an iPhone without the phone, the iPod nano (£129) and the iPod shuffle (£40). The original iPod was a music player that famously allowed you to carry 1,000 songs in your pocket. Today's iPod touch lets you watch videos and download apps from the iOS App Store. The iPods haven't been updated since 2012 (except for a small tweak to the iPod touch in 2013).



### Apple TV **JAN 2013**

The Apple TV is a 10cm square box that measures less than an inch high. You plug the device into your HDTV so that you can watch movies and TV shows from the iTunes Store. You can also play content from Netflix (for a £5.99 a month subscription), view videos on YouTube and Vimeo, and stream music and photos from iCloud. You can also view whatever is on your iPhone, iPad and iPod touchscreen, and push content from your Mac to your TV screen. The Apple TV costs £79, but the hardware hasn't been updated since 2012.



### Apple Watch **APRIL 2015**

Apple unveiled its first foray into wearable technology in September 2014, and six months later launched. There are 38 different Apple Watches available – thanks to the combination of the three different Apple Watch categories, two different face sizes, and the accompaniment of straps. Apple has said that Apple Watch prices will start at £299 for the 38mm Apple Watch Sport or £339 for the 42mm version. The Stainless Steel Apple Watch will cost from £479, while the 18-carat gold Apple Watch Edition will cost from £8,000.



# Apple Store

## HOW AND WHERE TO BUY YOUR APPLE PRODUCTS

It's easy to buy a brand-new Mac, iPad or iPhone from Apple. The simplest way is to go to [store.apple.com/uk](http://store.apple.com/uk) to purchase from the online store. Here you will find every current Mac, iPad and iPhone, and lots of accessories. Alternatively, if you'd prefer to try the product out, you could walk into the Apple Store on your high street or in your closest shopping mall. Not sure where your closest Apple Store is located? Apple has stores all over the country, 39 in total, and you can look for your local store at [apple.com/uk/retail](http://apple.com/uk/retail).

Unfortunately, as a rule Macs are not cheap but if you are looking for a bargain you can also pick up a Mac, iPad or iPhone second-hand from Apple. It's possible to buy refurbished Apple Macs, iPads, and other of the company's products, from a special section of the online store. Go to [store.apple.com/uk](http://store.apple.com/uk) and scroll to the bottom of the page where you will see a link to Refurbished & Clearance.

Refurbished Macs and iPads are likely to be brand new but returned models (if it is from a previous year) or reconditioned current devices. A reconditioned Mac could be an ex-demonstration model used during Apple teaching programmes, or a unit sold to a customer who subsequently decided to return it. The returned unit may have been faulty (and fixed) or may simply have been returned under the standard sale-and-returns procedure – Apple allows any customer to return a Mac bought from the Apple Store within 14 days for a refund as part of its standard returns policy.

The important thing to note is that Macs bought from the Apple Refurb Store are not discernibly different from new ones bought direct from the Apple Store. All the Macs bought from the Apple Refurb Store are cleaned, checked, tested and visually indistinguishable from brand-new models.

The only noticeable difference in our experience is that an Apple refurb Mac will be packaged in a brown box rather than the white retail box they normally arrive in. Aside from that, we have yet to pick up a Mac from the Refurb Store and find it wanting.

The price for reconditioned Macs changes frequently but is typically 10- to 20 percent less



Apple's online store can be found at [store.apple.com/uk](http://store.apple.com/uk).

than the original price. With Macs commanding a high retail price, this reduction can represent quite a difference. For example, you can find a 2014 (that's the current generation) 1.4GHz iMac on the Refurb Store for £759 – a £140 saving on the £899 you'd pay for the exact same model in the Apple Store. There are even bigger savings to be made on older models. You can also find refurbished iPads on the store, but Apple doesn't resell second-hand iPhones.

You may also be able to get a deal on a new Mac by picking up one from your local Apple reseller, such as John Lewis and PC World, or Apple premium resellers like iStore, Stormfront, Solutions Inc, Western Computers and KRCS. They do have sales, and although Apple bargains are rare, they do come along occasionally.

However, you should beware that because Apple is strict with pricing and the margin that third-party retailers can make, it is rare that you will find a genuine bargain when buying a new Apple product from someone other than

Apple. You should always first visit Apple's online store to find out what is on offer from the mothership, and make sure that if you are buying an outdated model you are doing so knowingly. Copy down the specification and product code of the model you want, and use that in your search. If you know what to look for you could grab a bargain – just make sure that you aren't buying last year's model while being sold the idea of this year's.

One of the benefits of buying from Apple is its warranty and returns procedure, even for refurbished products. Apple states: "Before we put a refurbished Mac, iPod, iPad or Apple TV up for sale in special deals, it undergoes a rigorous refurbishment process to make sure it's up to Apple's tough quality standards."

More importantly, a reconditioned Mac comes with the same one-year warranty (extendable to three years with AppleCare protection). You also get the same sales and return procedure with Apple, and can return a Mac bought from the Refurb Store within 14 days if you're not happy with it.

The key thing, as always, is to know exactly what you want, and exactly what you are getting, especially if you are buying from a private seller. Get it all in writing, and if at all possible view the device you are buying, and use it, before you purchase. Always use a credit card to make expensive purchases, or a secure payment service such as PayPal. This will make it much easier to chase up if there is a problem. And remember, if it looks too good to be true, then it probably is: you really want to see proof of purchase before you buy a second-hand Mac to ensure it hasn't been stolen



Apple Store, Covent Garden, London



Apple Store, Regent Street, London



# MacBook

## THE LATEST ADDITION TO APPLE'S LAPTOP LINE-UP

There are actually two standard MacBook models available, both with a 12in screen (measured diagonally). Dimensions for both unit are identical: 28.05cm by 19.65cm, and 3.5mm at the edge tapering to 131mm thick (the MacBook Air tapers from 17mm to just 3mm). The new MacBook weighs less than a kilogram at 920g.

The key difference between the two models is the amount of storage available, and the speed of the processor, although the most obvious difference is that there are three colour choices: gold, silver and space grey, just like the iPhone.

The entry-level MacBook unit offers a 1.1GHz dual-core Intel Core M processor (Turbo Boost up to 2.4GHz), and 256GB PCIe-based flash storage. The other MacBook unit offers a 1.2GHz dual-core Intel Core M processor (Turbo Boost up to 2.6GHz), and 512GB PCIe-based flash storage. Both models offer 8GB RAM and Intel HD Graphics 5300.

There don't appear to be any build-to-order options, which would normally allow you to add a faster Intel processor, more storage, and more RAM.

However, Apple did indicate in its press release announcing the product that there would be.

The new MacBook sports many new features including a Force Touch trackpad that utilises built-in force sensors so that when you click you receive haptic feedback, and Force Click – this adds a new dimension to clicking, a new way of right-clicking, perhaps. There is also a new keyboard with keys slightly more spaced out



than previously. Many of the new technologies incorporated in the new design have allowed Apple to make it slimmer and as lighter than any other Mac. For example, thanks to the new Core M chip the MacBook doesn't require fans, and by slimming down the logicboard Apple has been able to utilize every last corner for battery. Apple claims the MacBook is the "world's most energy efficient notebook".

Even the Retina display is the thinnest screen ever on a Mac. It offers a 16:10 aspect ratio and a resolution of 2304x1440. It also uses less energy than Retina displays on other Macs.

Apple admits that the MacBook is designed for the wireless world, and it has to be: there is only one port. This next generation USB-C port will support power in and out, so you can charge your MacBook from it, as well as plug in a hard drive or other peripherals. You will need an adaptor if you are hoping to plug more than one device in at a time, though.

### MacBook Connections

The MacBook infamously had only one port (plus a headphone port). That's the trade-off required for Apple to create such a thin Mac. The single port is USB-C, which is a new industry standard that offers 5Gb/s data transfer via USB 3.1, as well as charging and DisplayPort 1.2. You will be able to plug anything into that port – but you will require an adaptor if you want to plug more than one thing in at a time.

Like the MacBook Air, the MacBook doesn't feature an Ethernet port, so if you want to plug it into a wired network at work or on holiday you will need to purchase an adaptor. However, the MacBook does offer 802.11ac Wi-Fi so it's unlikely that in today's wireless world you will need to plug it into a network.

### Speed

The MacBook will not be Apple's fastest Mac, tests of other computers that use

the same chip suggests that the MacBook will be slower than last year's entry level MacBook Air, however, it does at least feature a SSD drive, so it could prove faster than Apple's other slowest Macs: the £899 iMac and the £399 Mac mini which utilize slower hard drive technology.

We're waiting to get the MacBook in our labs, and as soon as we do we will be testing them thoroughly.

### Price

There are many Mac users for whom the MacBook will not be ideal. This is not a powerful computer and it is no replacement for the MacBook Pro. Nor is it necessarily a replacement for a MacBook Air while it is possible to upgrade to faster MacBook Air models for a lot less money.

The MacBook does have some points in its favour. It is 160g lighter than the MacBook, smaller (even than the 11in MacBook Air) and thinner, so if you are carrying it around in your bag that might be a relevant factor in your decision. The other big difference is that the MacBook ships with just 8GB RAM while the MacBook Air ships with 4GB RAM, but you can always upgrade that at point of purchase.

Whether the tradeoff of weight and size is significant to you will depend a lot on what you will be doing with the MacBook. If the majority of what you do on your Mac is everyday tasks, such as sending and receiving email, browsing the web, and using office applications, the MacBook should be quite capable of meeting your needs. If you're expecting to edit movies using Final Cut Pro we don't expect this Mac to cut the mustard.

### Prices

The 256GB, 1.1GHz MacBook will cost £1,049  
The 512GB, 1.2GHz MacBook will cost £1,299

# MacBook Air

APPLE'S THINNEST, LIGHTEST LAPTOP

There are four standard MacBook Air models available, in two sizes. In March 2015, each MacBook Air was updated and now offers a 1.6GHz dual-core Intel Core i5 processor, 4GB of RAM and Intel HD Graphics 6000 as standard.

There are also build-to-order options that let you add a faster Intel processor (the 2.2GHz dual-core i7, for £130), more storage (512GB SSD for £240) and 8GB of RAM (for £80).

The only real differences between the different models are the size of the screen, the amount of storage and battery life. Both the 11in and 13in MacBook Air offer either 128GB or 256GB SSD options. The 11in MacBook Air offers nine hours of battery life, compared with the 12 hours of the 13in MacBook Air. The 11in MacBook Air weighs 1.08kg and its dimensions are 30x19.2cm. The 13in MacBook Air weighs 1.35kg and its dimensions are 32.5x22.7cm. Both models are just 1.7cm thin at the edge and taper to 3mm at the front.

Because of its smaller screen, the 11in MacBook Air offers fewer pixels than the 13in model – up to 1366x768 at a 16:9 aspect ratio, compared with 1440x900 at a 16:10 aspect ratio on the 13in. That display doesn't come close to what you get from the 13in MacBook Pro Retina model, though – that Pro offers 2560x1600 Retina resolution at 227 pixels per inch.

The two Airs have different aspect ratios. The 11in model is the only Mac with a 16:9 ratio – the same as a widescreen TV. Some people find the narrower screen more restrictive. The MacBook Air doesn't have a great many

ports – that's the trade-off required for such a remarkably thin computer. There's no ethernet port, for example, so if you want to plug it into a wired network at work or on holiday, you'll need to buy an adaptor. However, the MacBook Air does offer built-in 802.11ac Wi-Fi, so it's unlikely that in today's wireless world you will ever need to plug it into a network anyway.

The MacBook Air also lacks an optical drive – the only Mac still to feature a CD/DVD drive is the MacBook Pro (the non-Retina model). We don't find we have much use for an optical drive these days, but if you really think you need one there is always the option of purchasing Apple's USB SuperDrive for £65.

There are two USB 3 ports, and you can also connect accessories (including external storage and monitors) to your MacBook Air via its Thunderbolt port, Apple's high-speed connector. Thunderbolt 1 is slightly slower than the Thunderbolt 2 ports on the Retina MacBook Pro, but still faster than USB 3 (20Gb/s for Thunderbolt 2, compared with 10Gb/s for Thunderbolt 1 and 5Gb/s for USB 3). The 13in

MacBook Air comes with an SDXC card slot, but the 11in model doesn't.

## Speed

The MacBook Air is one of the slowest Macs around – along with the £899 iMac and the £399 Mac mini. However, one of the MacBook Air benefits is its solid state drive (sometimes referred to as flash), which speeds up operation. Flash memory is superior to a hard drive because it is faster at reading data and the 13in drive is even faster than the 11in. This makes a huge difference when running your Mac: opening documents, starting applications and even booting up all happen much faster.

Whether all that matters to you depends a lot on what you will be doing with your computer. If the majority of what you do on your Mac is everyday tasks, such as sending and receiving email, browsing the web and using office applications, then the MacBook Air is quite capable of meeting your needs. You can also happily use it for editing short videos or working with photos.

## Price

There are four standard versions of the MacBook Air available and various build-to-order options that you can add on a point of purchase.

### Prices

11in MacBook Air 1.6GHz (128GB) £749  
11in MacBook Air 1.6GHz (256GB) £899  
13in MacBook Air 1.6GHz (128GB) £849  
13in MacBook Air 1.6GHz (256GB) £999

### Build-to-order options

2.2GHz dual-core Intel i7 £130  
8GB RAM £80  
512GB flash storage £240

We recommend that you purchase the extra RAM when you buy the MacBook Air as it cannot be upgraded later. If you feel you need more storage, you could buy an external hard drive or an NAS drive to store content on and back things up when necessary.



# MacBook Pro

## A SUPERIOR MAC LAPTOP WITH A DISPLAY TO MATCH

There are five standard Retina MacBook Pro models available, in two sizes, as well as a non-Retina MacBook Pro, which we will cover at the bottom of this page. In March 2015, Apple updated the 13in models, and in May 2015 it updated the 15in models.

The key selling point is the Retina display, so called because it delivers maximum optical quality – the human eye is unable to distinguish any more pixels. That makes a Retina display about as precise as you can get, ideal for creative work.

The 13in model offers 2560x1600 Retina resolution at 227 pixels per inch, while the 15in model offers 2880x1800 resolution at 220 pixels per inch.

Unlike the MacBook Air range, the five Retina MacBook Pro models are substantially different in terms of spec, with the 15in models being equipped with quad-core i7 chips (2.2GHz or 2.5GHz), 16GB of RAM and more. The three new 13in Retina MacBook Pro units offer a dual-core Intel Core i5 processor (2.7GHz on two models, and 2.9GHz on the high-end version), 8GB of RAM, and Intel Iris graphics as standard.

The 13in models are available with 128GB, 256GB or 512GB flash storage, while the 15in models skip the 128GB version, offering only 256GB or 512GB.

There are various build-to-order options for the 13in models that allow you to add a faster Intel processor (a 3.1GHz dual-core i7, for £170), more storage (1TB SSD for £400) and 16GB of RAM (for £160).

The build-to-order options available for the 15in models include a faster 2.8GHz quad-core i7 Intel processor for £150, and 1TB storage for £400. It's worth remembering that the 2.8GHz clock speed of i7 Intel upgrade doesn't mean that the chip is slower than the 3.1GHz dual-core processor offered with the 13in MacBook Pro Retina model: it's an i7 and it's a quad-core, so it will be faster.

One of the key distinctions between the MacBook Air range and the MacBook Pro Retina models is battery life. The 11in MacBook Air offers nine hours of battery power and the 13in MacBook Air offers 12 hours. This compares with nine hours for the 13in MacBook Pro Retina, and nine hours for the 15in Retina model.

The other significant difference between Apple's laptop ranges lies in their weight and dimensions. The 13in Retina MacBook weighs 1.57kg, compared with the 1.35kg of the 13in MacBook Air. However, the dimensions of the 13in Retina MacBook are 31.4x21.9cm compared with 32.5x22.7cm for the MacBook Air – so the 13in Air is a slightly larger unit.

The 13in MacBook Pro isn't very much thicker than the MacBook Air either, measuring 1.8cm, while the Air is just a centimetre thinner,



measuring 1.7cm at its thickest point (though it slims to 3mm at the front edge). The 15in MacBook Pro with Retina display measures 35.9x24.7cm and weighs 2.02kg. It's the same thickness as the 13in model at 1.8cm.

The MacBook Pro with Retina display has a few more ports on offer than the MacBook Air. Like the MacBook Air, the MacBook Pro Retina doesn't feature an ethernet port, but it does have built-in 802.11ac Wi-Fi, and if you need to plug into a wired network you will be able to buy an adaptor separately.

There are two USB 3 ports, but you can also connect accessories (including external storage and monitors) to your Retina MacBook Pro via the two Thunderbolt 2 ports (that's one more than on the MacBook Air, which uses the slower Thunderbolt 1). Thunderbolt is Apple's high-speed connector, which is faster than USB 3 (20Gb/s compared with 5Gb/s). You can buy various adaptors that let you plug FireWire 800 hardware, for example, into this port.

You will also find an HDMI port (for plugging into your TV) and a SDXC card slot (for your camera's memory stick) on both Retina MacBook Pro models.

If you are looking for a Mac capable of playing a DVD or CD, then you may want to look at the MacBook Pro without Retina display (see below), or buy a £65 SuperDrive separately. The new 13in MacBook Pro models come with Apple's ForceTouch trackpad, which will change the way you interact with your Mac.

### Speed

The 13in MacBook Pro Retina is faster than the MacBook Air, so if it's the fastest 13in MacBook you want then it's worth spending a little more on the Retina display model.

However, if you want the fastest Retina MacBook Pro, you really need to look at the 15in models. The 13in models have a dual-core processor, while the 15in models have a quad-core processor, and right up at the top of the range the 15in MacBook Pro with Retina display features a Core i7 2.5GHz processor.

### Price

There are five standard versions of the Retina MacBook Pro plus a range of build-to-order options that you can add on to your unit at the time that you purchase it. You can also purchase the MacBook Pro without Retina display, but we will deal with that unit separately, below.

#### Prices

13in Retina MacBook Pro 2.7GHz i5 (128GB)	£999
13in Retina MacBook Pro 2.7GHz i5 (256GB)	£1,199
13in Retina MacBook Pro 2.9GHz i5 (512GB)	£1,399
15in Retina MacBook Pro 2.2GHz i7 (256GB)	£1,599
15in Retina MacBook Pro 2.5GHz i7 (512GB)	£1,999

#### Build-to-order options

##### 13in Retina MacBook Pro

3.1GHz dual-core Intel i7 £170

16GB RAM £160

1TB flash storage £400

##### 15in Retina MacBook Pro

2.8GHz quad-core Intel i7 £150

1TB flash storage £400

If you think that you might need the extra RAM in your 13in Retina MacBook Pro, then we recommend that you purchase the extra RAM when you buy the Mac as it cannot be upgraded subsequently. If you feel you need more storage, you could buy an external hard drive or an NAS drive to store content on and back things up when necessary.

### Non-Retina MacBook Pro

As we mentioned at the start, the non-Retina MacBook Pro is the only Mac to offer an optical drive; it is also the only Apple laptop to still use a hard drive. The non-Retina MacBook Pro hasn't been updated since 2012 and many have been predicting its demise. That it still lives on is testament to the fact that there are people out there who want a Mac with a CD/DVD drive and a big hard drive. It offers a 2.5GHz dual-core Intel Core i5 processor, 4GB of RAM, a 500GB hard drive, and costs £899.



# Mac mini

## A TINY DESKTOP THAT'S APPLE'S CHEAPEST MAC

Two years after Apple last updated the Mac mini, it revamped its entry-level Mac and lowered prices. That October 2014 revamp resulted in three models of Mac mini.

The cheapest of the three Mac mini models has the same 1.4GHz dual-core processor and integrated graphics chip to be found on the MacBook Air and the entry-level iMac, so it's no surprise that the new Mac mini's processor and graphics performance is close to that of the current MacBook Air range and practically identical to the new £899 iMac. The MacBook Air has the edge due to its flash storage, while the Mac mini and iMac still feature a hard drive as standard.

The other two Mac minis offer Intel dual-core i5 2.6GHz and 2.8GHz processors with Intel Iris graphics. These chips are comparable to the processors inside the 13in Retina MacBook Pro, but, as with the MacBook Air, you can expect their faster flash storage to give these models a performance boost.

The Mac mini offers Intel i5 dual-core processor options as standard. There are i7 processors available at point of sale, but these are still only dual-core. Apple's previous generation of Mac mini models offered better, quad-core processors.

You can get a 2TB Fusion Drive for an extra £80 when you buy the £799 Mac mini, taking the price to £879. Only the top-of-the-range model offers this option.

The 2012 Mac mini server version offered a 2TB hard drive, which made it a popular choice among those looking for a media server, so Apple's decision to offer this 2TB Fusion Drive is probably a reaction to this.

The Mac mini weighs 1.22kg and its dimensions are 19.7x19.7cm. Its height is just 3.6cm.

The Mac mini's HDMI port makes it very popular for those wishing to set up a Mac media centre in their living room. This is despite the fact that the Mac mini lacks an optical drive – the only Mac that still features one is the MacBook Pro (the non-Retina model). There's not much call for an optical drive these days, but if you really think you need one there is always the option of purchasing Apple's USB SuperDrive for £65.

You will also find four USB 3 ports, an SDXC card slot, two Thunderbolt 2 ports and an IR receiver. The Mac mini used to offer a FireWire 800 port, which will be important to those who have previously made big investments in FireWire peripherals, although you could purchase a Thunderbolt to FireWire adaptor and continue to use your FireWire devices (there are two Thunderbolt 2 ports on the Mac mini, offering a throughput of 20Gb/s). The only Mac that still offers FireWire is the non-Retina MacBook Pro.

Another reason why the Mac mini has been a popular choice was the ease with which it could be upgraded. RAM, for example, could be slotted simply into place – unheard of in the majority of current Macs. Unfortunately this is no longer an option with the latest models, and you have to add extra RAM at the point of purchase if you think you will need it.

In the past the Mac mini has been pressed into service as a graphic designer's workstation, a home media centre for the family and even a web server for hosting entire commercial websites. However, the latest changes make this model more suited for consumers looking for the cheapest Mac available.

### Speed

The Mac mini is not one of Apple's fastest Macs. The processor is comparable to the MacBook Air's, but the mini is scuppered by its slower hard drive. However, you could upgrade your Mac mini to a Fusion Drive for another £200, bringing the benefit of a faster flash drive combined with 1TB of standard storage. It's a setup that could deliver you a surprisingly speedy Mac for just £599.

The big disappointment with the current range of Mac mini models is that they lack the processor performance of the



previous models, first introduced in 2012. The October 2014 update saw the departure of quad-core processor options, for example. In our Geekbench tests we saw a very small increase in single-core mode, but the new top-of-the-range model scores just 56% of the older top-of-the-range model's speed when it came to multi-threaded applications. At least in terms of graphics processing the new Mac minis take the upper hand, benefiting from newer integrated graphics chips.

### Price

There are three Mac minis available, with a few build-to-order options that you can add on at point of purchase.

#### Prices

Mac mini 1.4GHz dual-core i5 (500GB) £399  
Mac mini 2.6GHz dual-core i7 (1TB) £569  
Mac mini 2.8GHz dual-core i7 (1TB Fusion drive) £799

#### Build-to-order options

3GHz dual-core Intel i7 £160  
16GB RAM £160  
1TB Fusion Drive £160  
256GB SSD £160  
512GB SSD £240

If you think you might need the extra RAM we recommend you purchase it when you buy the Mac mini. It used to be possible to upgrade the RAM in a Mac mini but this is no longer possible as it is now soldered on. We would recommend the Fusion Drive option as the SSD part of the storage will speed things up considerably, while the extra capacity of the drive is likely to come in handy. If you are setting the Mac mini up as a home media centre you may want an optical drive, but you can always purchase a SuperDrive for £65, and continue to play DVDs and CDs that way.



# iMac

## APPLE'S SUPER-THIN, ALL-IN-ONE DESKTOP COMPUTER

You may think the iMac was only recently updated, with a new 5K Retina iMac joining the one introduced in October 2014. However, the rest of the iMac range, with the exception of the £899 model introduced in June 2014, has not been updated since September 2013. The iMac line-up includes three 21.5in versions, one 27in model and two Retina 27in systems.

The £899 entry-level 21.5in iMac has a 1.4GHz dual-core i5 chip, 8GB of RAM and a 500GB hard drive. Next up is an iMac that for another £150 gives you a faster 2.7GHz i5, 8GB of RAM and a 1TB hard drive. For another £150, the top-of-the-range 21.5in iMac offers a 2.9GHz i5, 8GB of RAM and a 1TB hard drive.

All the 27in iMacs also offer quad-core i5 chips, which will deliver more power than the smaller iMacs. The entry-level 27in iMac has a 3.2GHz quad-core i5 processor, 8GB of RAM and a 1TB hard drive, but lacks a Retina display.

There are two 27in Retina models. The original offers a 3.5GHz quad-core i5 processor with 8GB of RAM as standard (you can add 16GB or 32GB of RAM and a 4GHz quad-core i7 at point of purchase for a price), plus a Fusion Drive as standard. It will cost you £1,849. There's now a new £1,599 model with 3.3GHz processor. The Retina iMacs use AMD Graphics, while the non-Retina 27in uses nVidia.

You may be wondering why the iMacs don't yet feature SSD flash drives (with the exception of the Fusion Drive in the top of the range Retina iMac). So are we. Luckily, there are various build-to-order options which allow you to add Fusion Drives and flash storage, as well as up to 16GB of RAM, and faster processors (3.1GHz dual-core i7, for £160 on the 21.5in; 4GHz quad-core i7 for £200 on the flagship. Flash storage options include 256GB SSD for £160, 512GB SSD for £400, and a Fusion Drive (which combines flash storage with a hard drive) for £160. The Fusion Drive is a great solution, allowing you to benefit from more storage capacity and a faster experience.

The only upgrade options on the entry-level £899 iMac are the Fusion Drive (£200) and other SSD options.

The graphics cards are another differentiator between the different iMacs. The £899 model features the Intel HD 500 found in the MacBook Air, the next model up has an Intel Iris Pro, while the top-of-the-range 21.5in iMac features the nVidia GeForce GT 750M. The non-Retina 27in model offers the nVidia GeForce GT 755M.

The specs of the 21.5in iMacs are now below the MacBook Air and MacBook Pro, so it may be worth the laptops for power. Obviously the need for portability may play a big part in a choice between the two, though. Remember that if you choose a laptop, you can always plug it into your screen when you are at your desk.



Wondering how much space it will take up on your desk? The 21.5in iMac measures 52.8x45cm. The 27in iMac dimensions are 65x51.6cm. The screen is just 5mm thick. The base of the stand is 17.5cm deep on the 21.5in and 20.3cm on the 27in. The iMacs weigh 5.68kg or 9.54kg, so we don't recommend carrying them around.

The iMac offers an SDXC slot, USB slots, Thunderbolt 1 ports, 802.11ac Wi-Fi and ethernet. The Retina iMacs are the only ones with Thunderbolt 2.

There is no optical drive. Apple traded in the built-in SuperDrive when it slimmed down the monitor to a superthin 5mm. If you really think you need one, you can always buy Apple's USB SuperDrive for £65.

### Speed

The flagship Retina iMac is one Apple's fastest Macs, and comparable to the Mac Pro. In fact, we would prefer the Retina iMac thanks to its gorgeous 5K Retina display (an equivalent display would cost around £1,500 extra for the Mac Pro).

Among the 2013 models still available, it is likely that it is the hard drive that slows down this generation of iMacs, so if you add a Fusion Drive you will be giving your iMac a huge boost.

The entry-level £899 iMac is one of the slowest Macs around. Those purchasing one should upgrade it with a £200 Fusion Drive – which combines an SSD with a hard drive – as this will make a much bigger impact than spending £150 to get the 2.7GHz iMac.

There is also quite a leap from the 21.5in iMac models to the 27in models. This isn't surprising as the 27in iMacs are aimed at the power user, and have a price to match.

### Price

There are six iMac models available, with a few build-to-order options that you can add on at point of purchase. Our top iMac recommendation is that you buy a Fusion drive or an SSD as a build-to-order option. The iMac line-up is let down by the hard drives they are equipped with as standard.

It's also worth updating a 21.5in model at the same time as you purchase one so that it takes 16GB of RAM rather than the 8GB supplied as standard – it's not possible to update the RAM at a later date. However, the 8GB of soldered-on RAM on the entry-level 1.4GHz iMac cannot be upgraded at all, even at point of purchase. Accordingly we recommend the Fusion Drive option as it will speed up performance.

### Prices

21.5in iMac 1.4GHz (500GB) £899  
21.5in iMac 2.7GHz (1TB) £1,049  
21.5in iMac 2.9GHz (1TB) £1,199  
27in iMac 3.2GHz (1TB) £1,449  
27in iMac Retina 3.5GHz (1TB) £1,599  
27in iMac Retina 3.5GHz (1TB Fusion drive) £1,849

### Build-to-order options

3.1GHz quad-core Intel Core i7 £160 (21.5in only)  
3.5GHz quad-core Intel Core i7 £190 (27in only)  
4GHz quad-core Intel Core i7 £200 (Retina iMac only)  
16GB RAM £160  
32GB RAM £480 (27in only)  
3TB hard drive £120 (27in only)  
1TB Fusion Drive £160  
3TB Fusion Drive £280 (27in only)  
256GB SSD £160  
512GB SSD £400  
1TB SSD £800 £640 (3.5GHz Retina)

# Mac Pro

## APPLE'S PROFESSIONAL WORKSTATION

Having neglected the Mac Pro for a few years, Apple eventually updated the line-up at the end of 2013. That leaves us with two standard Mac Pro models – a quad-core 3.7GHz Intel Xeon E5 (£2,499) and a six-core 3.5GHz Intel Xeon E5 (£3,299).

As well as sporting more cores and a different processor, the top-of-the range Mac Pro also features 16GB of RAM (rather than 12GB) and faster graphics cards – the Dual AMD FirePro D500 with 3GB of GDDR5 VRAM each (rather than the Dual AMD FirePro D300 with 2GB GDDR5 of VRAM). These are dual graphics cards, one of the selling points of the Mac Pro.

Apple claims that with the additional power, users will be able to “seamlessly edit full-resolution 4K video while simultaneously rendering effects in the background – and still have enough power to connect up to three high-resolution 4K displays”.

Both standard units also feature 256GB flash storage, with build-to-order options for 512GB or 1TB of flash storage.

Those buying the Mac Pro will be choosing from the various build-to-order options, of which there are many. Choices include a 12-core 2.7GHz processor, 64GB of RAM, a 1TB flash drive, and the Dual AMD FirePro D700 GPUs with 6GB of GDDR5 VRAM. If you were to build the ultimate Mac Pro, it would cost £7,299.

Wondering how much space the Mac Pro will take up on your desk? The Mac Pro has a diameter of 16.7cm and is 25.1cm tall. It weighs 5kg, a fraction less than the 21.5in iMac. The old aluminium Mac Pro is a giant in comparison.

The Mac Pro offers six Thunderbolt 2 ports – that's enough to drive three 4K displays or six Thunderbolt displays, if you wanted to. You'll also find dual gigabit ethernet – two ethernet controllers, each connected to its own lane, ensuring that there is enough bandwidth to operate at full speed. As you would

expect, the Mac Pro also offers 802.11ac Wi-Fi.

There is no FireWire port on the Mac Pro, but you can get a Thunderbolt to FireWire adaptor. There are four USB 3 ports, as with the Mac mini and iMac.

The Mac Pro lacks an optical drive. Most people probably have little use for an optical drive these days, but if you really think you need one, then there is always the option of purchasing Apple's USB SuperDrive for £65.

### Speed

As you would expect from Apple's flagship Mac, the Mac Pro is fast. However, the year-old 27in iMac and the top-of-the-range 15in MacBook Pro aren't that far behind the entry-level Mac Pro. And if you bump up your iMac when you buy it with build-to-order options you can get a Mac for your money that rivals even the six-core Mac Pro model.

But there is more to the Mac Pro than the speed and many users will be attracted by many of its advanced technologies, such as the dual GPUs, the powerful multicore processors, the Thunderbolt 2 ports, and the superfast flash storage. For many, the build-to-order options will let them build a professional and powerful workstation capable of doing things iMac users can only dream of.

Yet there is something to be said for the iMac with 5K Retina display. The standard 5K iMac features an incredible screen, backed by a 3.5GHz quad-core Intel i5 CPU, 8GB of RAM, 1TB Fusion drive and AMD Radeon R9 M290X GPU for £1,999. Build-to-order options include a 4GHz i7 (£200), and upgrading the GPU to an AMD Radeon R9 M295X for £200. If you added these two features to the iMac, you would pay £2,399, which is still less than the Mac Pro and includes a 5K display; an equivalent Dell display costs just under £2,000.

### Price

There are two Mac Pro models available, with a number of build-to-order options that you can add on at the point of purchase.



Configuring the ultimate Mac Pro will cost you a cool £7,779. If you have any cash left over, then you could add a Sharp 32in 4K monitor to that for another £2,999. Or why not go the whole hog and add three Sharp 4K monitors, setting you back £16,776. That would be some Mac setup.

If you have the cash, we would recommend the six-core Mac Pro over the quad-core, but even better, add as many build-to-order options as you can afford.

### Prices

Mac Pro 3.7GHz (quad-core) £2,499  
Mac Pro 3.5GHz (six-core) £3,299

### Build-to-order options

3.5GHz six-core with 12MB of L3 cache £400 (quad-core only)  
3GHz eight-core with 25MB of L3 cache £1,600/£1,200  
2.7GHz 12-core with 30MB of L3 cache £2,800/£2,400  
16GB RAM £80 (quad-core only)  
32GB RAM £400/£320  
64GB RAM £1,040/£960  
512GB SSD £240  
1TB SSD £640  
Dual AMD FirePro D500 GPUs with 3GB GDDR5 VRAM £320 (quad-core only)  
Dual AMD FirePro D700 GPUs with 6GB GDDR5 VRAM £800/£480





# Which Mac?

## HOW TO CHOOSE THE MAC THAT WILL SUIT YOU

With so many Macs to choose from, each with very different features and specs, it can get a little tricky when it comes to deciding which Mac to buy. How do you know which Mac is best for you? Should you buy a Mac mini, an iMac or a Mac Pro? Or would you be better off with a MacBook, MacBook Air or a Retina MacBook Pro? Which Mac is best for you really depends on your needs and how much you are prepared to spend to meet them.

As a rule Macs are more expensive than PCs, but that's really because there are more low-cost PCs available. If you want a laptop that costs less than £300, then you will have to settle on a PC (or find yourself a second-hand Mac). However, we think it's worth spending a little more to get a lower-priced Mac, rather than saving a few pounds buying a budget PC.

If you want to spend as little as possible on your new Mac, you have a few choices. The Mac mini is an obvious one, with the price starting at £399, but you will need to factor in the cost of a display as well as a mouse and keyboard if you don't already have those peripherals.

An alternative might be the £799 11in MacBook Air, which is a neat little laptop, although you may end up buying a separate display to plug into when sitting at your desk.

If you are happy to spend a little more on a reasonably priced Mac laptop, then you might like the 13in MacBook Air or the 13in MacBook Pro with Retina display. These models start at

£849 for the Air, and £999 for the Pro, with the Pro version bringing a faster

processor and more RAM as well as that gorgeous Retina display. The one thing in favour of the Air is the longer battery life (12 hours as opposed to nine). There is also the weight difference, but it's quite minor really – the Pro is 1.57kg, while the Air weighs 1.08kg. There's is now the added option of the new MacBook. Weighing in at 920g, it's lighter than any other Mac laptop, though, also less powerful. It's priced at £1,049 and £1,299.

If it's a reasonably priced desktop you are after, then the £899 iMac might look like a good option, but you should note that the specs in that machine are pretty similar to those in the £399 Mac mini. With that in mind, it might be better to spend a little more to get one of the other two 21.5in iMacs, although both of those cost more than £1,000.

Another option would be to get a build-to-order version of the iMac with a Fusion drive, which will bring a faster flash drive into the equation for an extra £200. That would bring the price of your iMac to £1,099, or if you did the same with the Mac mini, £599. In both cases we've found the Fusion drive a better option than the next model up in the same range, because the additional flash memory will speed up the Mac more than another model still restricted by a standard hard drive.

But what if you are prepared to spend a little more to get a decent Mac laptop? In that case we'd

recommend the 15in Retina MacBook Pro. It costs £1,599 but comes with a decent quad-core Intel Core i7 processor as well as 16GB of memory. It also comes with 256GB of flash storage; if you think you need more you can get 512GB for £1,999, but we'd probably go for an external hard drive if we needed extra space.

If you want to spend a little more to get a decent Mac desktop, then the 27in iMac is a great option. Prices start at £1,499 and you get a decent quad-core Intel Core i5 processor. The only thing that lets the iMac down compared to the MacBook Pro is the slower hard drive that comes as standard, and the 8GB of RAM. Both of these factors can be rectified when you buy the Mac, as you can take up the 16GB of RAM option for an additional £160, and a Fusion drive or 265GB flash storage for another £160. That would bring the price of your iMac to £1,769.

If it's a top-of-the-range Mac you want, then you have two choices: the 27in Retina 5K display iMac, which costs £1,999; or the Mac Pro, Apple's workstation-class Mac, which features a Xeon E5 processor, 12GB of RAM, dual AMD graphics cards and 256GB of flash storage, with prices starting at £2,499. The Retina iMac comes with a Fusion drive, 8GB of RAM, and a superfast Intel quad-core i5 processor. That's a difference of £500, although with the iMac you gain the gorgeous display; to get a similar 5K display, such as Dell's UltraSharp 27 Ultra HD, to use with your Mac Pro would set you back £1,762. We'd be inclined to recommend the iMac in this case.



# iPhone 6 Plus

APPLE'S BIGGEST PHONE, THE IPHONE PHABLET

When Apple introduced the iPhone 5 in 2012, it described it as the perfect size for a smartphone – you could hold it comfortably in one hand while reaching all four corners with the thumb of that hand. Apple might have been convinced back then that a 4in screen was perfect, but in the years that followed alternative smartphones arrived in sizes that dwarfed the iPhone 5. By 2014 the iPhone was one of the smallest smartphones available; it seemed that people didn't really mind that much if they couldn't reach the corner with their thumb.

Apple launched its first entry into the phablet category in September 2014. The iPhone 6 Plus is Apple's biggest ever iPhone with a screen

that measures a whopping 5.5in (diagonally) and offers 1920x1080 resolution at 401 pixels per inch. Phablet is the term used to describe a large phone that is almost a tablet. The popularity of phablets is thought by some to be causing a decline in interest in tablets themselves, as people turn to large phones that have good-sized screens and bring the advantage of operating as a mobile phone.

The iPhone 6 Plus is available in silver, gold or space grey, and measures 158.1mm tall by 77.8mm wide, is a mere 7.1mm thick and 172g in weight. Apple addressed its concerns about users' comfort when holding such a big phone: the iPhone 6 Plus comes with a Reachability feature, which at a double-tap on the home button brings the top of the screen down so you can reach the controls.

The iPhone 6 Plus features Apple's A8 chip and the M8 motion co-processor. The motion co-processor chip is used to collect sensor data – it's a clever way to save battery life as it bypasses the processor. A barometer is also included inside the iPhone 6 Plus.

The iPhone 6 Plus offers Touch ID, and like the iPhone 6, NFC, which is a necessary technology if you intend to use Apple Pay (not yet launched in the UK).

There is also a new 8Mp iSight camera on the back with focus pixels and an f/2.2 aperture (also shared with the iPhone 6). The iPhone 6 Plus camera is the only Apple iPhone to offer optical image stabilisation, which makes for better pictures in low light. The iPhone 6 Plus shares many of its other camera features with the iPhone 6, including 43Mp panorama and the option of recording HD video at 60fps and slo-mo video at 120fps or 240fps. You also get cinematic video stabilisation and continuous autofocus video in both iPhone 6 models. Another feature offered only by the iPhone 6 and 6 Plus is 802.11ac Wi-Fi (other iPhones only go as high as 802.11n).

Perhaps the biggest deal for those looking to purchase a new phone is battery life. Apple says that the iPhone 6 Plus battery life gives up to 24 hours of talk time on 3G; up to 16 days/384 hours on standby; up to 12 hours of internet use on 3G, up to 12 hours on LTE, and up to 11 hours on Wi-Fi; up to 14 hours of video playback; and up to 80 hours of audio playback.

By contrast, Apple says that the iPhone 6's battery life gives up to 14 hours of talk time on 3G; up to 10 hours of internet use on 3G, up to

10 hours on LTE, and up to 11 hours on Wi-Fi; up to 11 hours of video playback; and up to 50 hours of audio playback.

So the iPhone 6 Plus gives you the most battery life you can get from an iPhone. This is no real surprise, as the iPhone 6 Plus's battery is listed at 2915mAh at 3.82 volts, which is substantially larger than the iPhone 6's 1810mAh battery.

### Speed

The iPhone 6 and iPhone 6 Plus are powered by the same A8 processor, but at different clock speeds. The iPhone 6 Plus runs at 1.39GHz compared with the iPhone 6's 1.2GHz.

For that reason, the iPhone 6 Plus is faster than the iPhone 6. When we ran Geekbench the iPhone 6 Plus scored 1,626 (single-core) and 2,917 (multicore), while the iPhone 6 scored 1,517 (single-core) and 2,586 (multicore).

Graphics performance is also good, but we've yet to notice any real difference between the iPhone 6 Plus and the iPhone 5s, although as more graphics-heavy games appear you may be glad of the extra graphics prowess.

### Price

The iPhone 6 Plus starts at £619. Each of the three models available costs £80 to £90 more than the equivalent capacity iPhone 6.

#### Prices

16GB iPhone 6 Plus £619  
64GB iPhone 6 Plus £699  
128GB iPhone 6 Plus £789

However, we'd advise against buying the 16GB entry-level version – you are likely to find it frustrating staying within 16GB, especially when Apple next updates its operating system (in 2014 the OS required as much as 5GB of space on some iPhones). The 64GB iPhone 6 Plus costs just £80 more for four times as much storage.



# iPhone 6

## THE 4.7IN SUCCESSOR TO THE IPHONE 5S

The iPhone 6 Plus wasn't the only larger iPhone to launch in 2014. The iPhone 6 was also introduced, with a screen that measures 4.7in (diagonally) and offers 1334x750 resolution at 326ppi.

This suggests that the iPhone 6 has the same pixel density as the iPhone 5s, but Apple has still dubbed its new screen 'Retina HD', presumably because it is counting the total number of pixels on display, rather than how close together they are. The iPhone 6 Plus offers a higher pixel density of 401ppi and is also described as Retina HD. Despite the similar sounding pixel count between the iPhone 6 and iPhone 5s, Apple has also made modifications to the newer screens' design, adding dual-domain pixels that allow for improved viewing angles, and other features that enhance the visibility of the display as well as a better contrast ratio (the contrast ratio on the iPhone 6 is in fact better than that on the iPhone 6 Plus).

iPhone 6 sports the same curvaceous design as the iPhone 6 Plus, albeit slightly smaller dimensions. It measures 138.1mm tall by 67mm wide, is just 6.9mm thick, and weighs 129g. It is available in silver, gold or space grey.

Although smaller than the iPhone 6 Plus, the iPhone 6 is still very large, and only the most gigantic hands would be able to comfortably reach to the edges in one-handed use. As a result Apple, also offers Reachability on the iPhone 6, which allows you to double-tap on the home button to pull the top of the screen down so you can reach the controls.

One major design change for the iPhone 6 and iPhone 6 Plus is the relocation of the on-off button. This was found at the top of the phone in previous generations, but now the button has moved to the side of the phone to make it easier to reach when you are holding it one-handed (the new home for this button does make taking screen shots harder, though).

Like the iPhone 6 Plus, the iPhone 6 features Apple's A8 chip and the M8 motion co-processor. The A8 is 50 percent more power-efficient than the A7, according to Apple.

A barometer is also included for measuring air pressure to determine your elevation (it can basically tell if you have been going upstairs). This is one of the new fitness and health features available to iPhone users. All iPhones also offer an accelerometer and gyroscope for the same purpose.

The iPhone 6 also offers Touch ID, and, as does the iPhone 6 Plus, NFC, which is a necessary enabling technology for using Apple Pay (not yet launched in the UK).

All of Apple's current iPhones offer an 8Mp camera. The iPhone 6 and iPhone 6 Plus camera still only offers 8Mp, but it gains focus pixels. Both iPhone 6 models and the iPhone 5s offer an f/2.2 aperture.

The iPhone 6 shares some other camera features with the iPhone 6 Plus. These include 43Mp panoramas, the option of recording HD video at 60fps and slo-mo video at 120fps or 240fps. There is also cinematic video stabilisation and continuous autofocus video. You will also find 802.11ac Wi-Fi in the iPhone 6, while the older models only go as high as 802.11n.

When it comes to battery life, Apple says that the iPhone 6 offers up to 14 hours of talk time on 3G; up to 10 hours of internet use on 3G, up to 10 hours on LTE, and up to 11 hours on Wi-Fi; up to 11 hours of video playback; and up to 50 hours of audio playback. You'll get more battery life from the iPhone 6 Plus, but the iPhone 6 battery is still better than those in the iPhone 5s and iPhone 5c, which both have identical battery life, according to Apple. The iPhone 5s/5c handsets offer up to 10 hours of talk time on 3G; up to eight hours of internet use on 3G, up to 10 hours on LTE, and up to 10 hours on Wi-Fi; up to 10 hours of video playback and up to 40 hours of audio playback.

### Speed

Both the iPhone 6 and iPhone 6 Plus are powered by the same A8 processor, but it's running at different clock speeds. The iPhone 6 runs at 1.2GHz, while the iPhone 6 Plus runs at 1.39GHz, according to Geekbench.

When we ran Geekbench the iPhone 6 scored 1,517 (single-core) and 2,586 (multicore), while the iPhone 6 Plus scored 1,626 (single-core) and 2,917 (multicore).

Not surprisingly the iPhone 6 Plus is faster than the iPhone 6.



The iPhone 6 is faster than the iPhone 5s, though. The iPhone 5s scored 1,409 (single-core) and 2,549 (multicore).

Graphics performance is good, but you are unlikely to notice any real difference unless you are using really graphics-heavy games.

### Price

The iPhone 6 starts at £539 – £10 less than the original starting price of the iPhone 5s when it launched in 2013.

#### Prices

16GB iPhone 6 £539  
64GB iPhone 6 £619  
128GB iPhone 6 £699

Each of these phones costs £80 to £90 less than the same-capacity iPhone 6 Plus.

As we mentioned previously, we'd advise against buying the 16GB version as you are likely to find it frustrating staying within that 16GB storage limit, especially when Apple next updates its operating system (which in 2014 required as much as 5GB of space on some iPhones). The 64GB iPhone 6 costs just £80 more and for that you get 300% more storage.





## iPhone 5s

THE 4IN IPHONE WITH TOUCH ID

In 2013 Apple upgraded its existing iPhone platform, splitting the iPhone 5 into two in the process. It created the iPhone 5s, which features Touch ID to let you unlock your iPhone and pay for things on the App Store merely by touching your finger to the home button, and the more playful iPhone 5c, which comes in a range of colours. Both phones are still available from Apple, although the larger capacities are now discontinued. They remain good options for those looking for a cheaper iPhone.

The iPhone 5s screen measures 4in (diagonally) and offers 1136x640 resolution at 326ppi. Although this may suggest that the iPhone 5s has the same pixel density as the iPhone 6, the iPhone 6 has a greater number of pixels in total, not to mention a superior screen with better viewing angles and contrast ratio.

The iPhone 5s sports a different design to the iPhone 6 models and the iPhone 5c. The iPhone 5s is more angular, with sharper edges, while the other models have curved edges. It is the smallest and lightest iPhone, measuring 123.8mm tall by 58.6mm wide and just 7.6mm thick, and weighs 112g. Like the iPhone 6 models, the 5s is also available in silver, gold or space grey.

Both of the cameras on the iPhone 5s offer improvements when compared to the iPhone 5c. The camera on the back has bigger pixels, a bigger sensor, a new True Tone flash, and various other hardware and software features.

As far as the bigger pixels are concerned, larger pixels yield greater electrical output,

which produces clearer images in low-light conditions without any resort to messy noise-reduction techniques.

When Apple launched the iPhone 5s it was the first time that a smartphone manufacturer had opted to increase pixel size rather than pixel numbers. All iPhone cameras offer 8Mp – and this is sufficient. Cramming a load of pixels onto a sensor will not create a better image, it just means that the file size is bigger. The larger sensor and a bigger lens serve to let in more light, as does the faster aperture of f/2.2 instead of f/2.4. The faster f/2.2 aperture on the iPhone 5s really helps with indoor and dusky shooting. Both iPhone 6 models also offer a f/2.2 aperture.

The iPhone 5s lacks some of the camera features you'll find on the iPhone 6 Plus and iPhone 6, including 43Mp panoramas, the option of recording HD video at 60fps and slo-mo video at 120fps or 240fps. HD video and slo-mo features are all available on the iPhone 5s, but the quality is poorer. One other area where the iPhone 5s surpasses the iPhone 5c is the FaceTime camera, which offers auto HDR for photos.

Only the iPhone 6 models offer 802.11ac Wi-Fi. The older iPhone models only go as high as 802.11n.

When it comes to battery life, Apple says that the iPhone 5s offers up to 10 hours of talk time on 3G; up to eight hours of internet use on 3G, up to 10 hours on LTE, and up to 10 hours on Wi-Fi; up to 10 hours of video playback; and up to 40 hours of audio playback. You'll get more battery life from the newer, iPhone 6 models.

### Speed

The iPhone 5s is powered by the A7 processor, which was first introduced with this phone in 2013, running at 1.3GHz, according to Geekbench. When the A7 chip launched it was a giant leap on its own account, offering a huge speed improvement thanks to its 64-bit capabilities.

When we ran Geekbench, the iPhone 5s scored 1,409 (single-core) and 2,549 (multicore). By comparison the iPhone 6 scored 1,517 (single-core) and 2,586 (multicore), while the iPhone 6 Plus scored 1,626 (single-core) and 2,917 (multicore). The Geekbench score of the iPhone 5s was more than twice that of the iPhone 5c.



When it comes to games and graphics capabilities, the GPU performance of the iPhone 5s is superior to that of the iPhone 5c; we saw some big differences using GFXBench 2.7's T-Tex C24Z16 1080p offscreen test. The iPhone 5s was able to push 25 frames per second, more than three and a half times the number of frames supported by the iPhone 5c. While these results are below the iPhone 6 and 6 Plus, it is unlikely you will really notice the extra unless you are playing the most power-hungry games.

### Price

The iPhone 5s starts at £459, which is some £90 cheaper than the same model cost when it launched in 2013.

#### Prices

16GB iPhone 5s £459  
34GB iPhone 5s £499

The iPhone 5s is the only iPhone available with a 34GB capacity. Apple removed the 34GB option from the line-up for its iPhone 6 models, which come only in 16GB, 64GB and 128GB versions.

But at just £40 more it's a no-brainer to buy the 34GB version of the iPhone 5s. We'd advise against the 16GB version, as you are likely to find it frustrating staying within that storage limit. When Apple updates its operating system it will take even more than the 5GB of space required on some iPhones by its 2014 update.



# iPhone 5c

## APPLE'S CHEAPEST, MOST COLOURFUL IPHONE

When the iPhone 5c launched in 2013 it disappointed some who were hoping for a low-cost smartphone from Apple. At launch the iPhone 5c cost £469 – only £80 less than the equivalent iPhone 5s. Months later the company introduced a 8GB version of the 5c for £429. Now that same 8GB version of the iPhone 5c costs £319, a saving of £110. The big question, though, is whether £319 now represents a good price for the iPhone 5c.

If you are determined to buy an iPhone but don't want to spend a lot, then the iPhone 5c might be worth considering. If price is your main concern, it's also worth looking around for a second-hand iPhone, or you may find you can get a good deal on a new handset from your mobile phone network. All the prices we quote are what Apple sells the iPhone for if you purchase it off-contract, allowing you to shop around for a monthly plan or pay-as-you-go contract that suits you (or perhaps you already have a great contract and don't want to lose it). It is also likely you will be able to find a contract with one of the UK mobile networks that will give you an iPhone 5c handset for free.

The main issue with the iPhone 5c is that it offers just 8GB of storage space; although we have heard of some mobile networks offering 16GB iPhone 5c models, Apple doesn't. You may find it hard to imagine that you will ever need a great deal of storage space, but it's worth considering that when the next version of the iPhone operating system is released

you may well find that you will need more space to install the update than you have available on your iPhone.

In this case, while the leap up to the iPhone 5s is not easy to recommend – because at £140 more it is quite a significant extra chunk of cash – it will still give you twice as much potentially precious storage as the 5c. The 5s also comes with various other features such as Touch ID, so you can unlock your iPhone and pay for things on the App Store merely by touching your finger to the home button.

Like the iPhone 5s, the iPhone 5c has a screen that measures 4in (diagonally) and offers 1136x640 resolution at 326ppi.

The design of the iPhone 5c is more reminiscent of the original iPhone than the iPhone 5s and iPhone 6 models. It has a smooth plastic case that comes in five different colours: green, blue, yellow, pink and white. It's a fraction larger and heavier than the iPhone 5s, measuring 124.4mm tall by 59.2mm wide and just 8.97mm thick, and weighs 132g (only the iPhone 6 Plus is heavier).

In many ways the iPhone 5c is the same phone as the iPhone 5 was when it launched in 2012. Aside from the new case, on the inside the iPhone 5c has the same rear-facing camera and processor. The FaceTime camera on the front of the iPhone 5c is better than the one found in the iPhone 5, however, offering better visibility in low-light. The iPhone 5c will take panoramas, but burst mode shooting is not



available, nor is slo-mo video (both are available on all other iPhone handsets).

When it comes to battery life, Apple says that the iPhone 5c offers exactly the same battery longevity as the iPhone 5s: up to 10 hours of talk time on 3G; up to eight hours of internet use on 3G, up to 10 hours on LTE, and up to 10 hours on Wi-Fi; up to 10 hours of video playback; and up to 40 hours of audio playback.

### Speed

Although the iPhone 5c features the same A6 processor as the iPhone 5, in some of our tests it scored slightly worse than its predecessor. For example, the iPhone 5 was about 10 percent faster than the 5c in Geekbench tests. As for the iPhone 5s, that model's Geekbench score was more than twice that of the iPhone 5c. However, even these speeds will be more than enough for the average needs of a user.

The GPU performance of the iPhone 5c is also inferior to that of the iPhone 5s, with the latter achieving 25fps, more than 3.5 times more than the iPhone 5c. If you aren't playing games or editing video on your iPhone, though, it is unlikely that this will matter to you.

### Price

The 8GB iPhone 5c costs £319. There is only an 8GB model available from Apple, so if you want 16GB or more then you will need to move up to the entry-level 16GB iPhone 5s. But as the 16GB iPhone 5s costs £140 more than the 5c at £459, if you are considering the iPhone 5s, then you might as well fork out another £40 and get the 32GB version of the iPhone 5s for £499.



# iPad Air

## APPLE'S FULL-SIZED iPad

The iPad is Apple's tablet computer. It's partway between an iPhone and a laptop, offering you the extra screen space, but using exactly the same operating system as the iPhone, so if you already own an iPhone it will feel familiar. There are millions of apps available for the iPad that allow you to do anything from producing spreadsheets and presentations, to playing games, creating photographic masterpieces or editing home videos.

Apple sells two models of iPad Air: the iPad Air 2, launched in October 2014, and the iPad Air, which arrived the previous October. When the first iPad Air launched in 2013 it was already incredibly thin, just 7.5mm, but the iPad Air 2 is even thinner, a mere 6.6mm.

The Air 2 also has an upgraded rear-facing camera (8Mp to the iPad Air 1's 5Mp). There are certain shooting conditions in which the iPad

Air 2 demonstrates its superiority – particularly close-up detail under studio lighting and in low-light conditions. The iPad Air 2 also gains some camera software features including slo-mo and time-lapse video modes, as well as burst mode and a timer. And panoramas: the iPad Air 1 already had these, but they can now go all the way up to 43Mp. We're always surprised that anyone would use the iPad as a camera – it is a rather inconvenient size, yet people often use one to take photos and videos, perhaps because of the size of the viewfinder.

Both iPad Air models offer Retina displays with a resolution of 2048x1536 and a pixel density of 264ppi. However, the iPad Air 2 adds an anti-reflective coating and, thanks to new manufacturing technologies, Apple has been able to remove the 'air gaps' between different elements of the screen, which effectively gives users more display clarity and makes it easier to see the screen from different angles – valuable if, for example, you're sitting next to someone and sharing the iPad screen to watch a movie.

The Air 2 also comes with a Touch ID fingerprint scanner built into the home button. Touch ID is convenient, enabling you to unlock your iPad, or an individual app, with a single touch of a finger rather than a passcode or password. As apps and websites integrate Apple Pay, you will be able to use Touch ID on your iPad to pay for things. However, you won't be able to use the iPad in the high street as it lacks the requisite NFC chip.

Other differences between the iPad Air 1 and 2 include a gold finish as an option for the newer model. The iPad Air 2 is available in silver, gold and space grey, while the iPad Air 1 is available only in silver or space grey. The grey model has a black rim around the screen, but all other iPads are white on the front.

### Speed

The iPad Air 2 contains a new processor chip – the A8X, which is a souped-up version of the A8 that made its first appearance in the iPhone 6 and iPhone 6 Plus.

With its A8X processor chip, the iPad Air 2 is significantly quicker at general processing and handling graphical tasks than the iPad Air 1 (which has an A7 chip) – about 40 percent faster, on paper. But at this point that difference is more theoretical than practical. In our Geekbench tests the iPad Air 1 scored 1,468 (single) and 2,658 (multi), while the iPad Air 2 scored 1,818 (single) and 4,520 (multi).

In terms of graphics, Apple claims that iPad Air 2 users will see 2.5 times the graphics performance of the first iPad Air. That's great news for gamers, and video and photo-editing apps will also benefit from the enhanced graphics performance.

However, the iPad Air 1 can handle all current apps, and you're unlikely to see major speed gains with current software. Over time this may change but if all you do with your iPad is browse the web and read and write emails, then you are unlikely to notice any slowdown.

### Price

The iPad Air 2 starts at £399 for the 16GB version. Next up is the 64GB model for just £80 more at £479, and the 128GB model costs £559.

The 16GB iPad Air 1 is just £80 cheaper than the entry-level iPad Air 2, at £319. Or you can pay another £40 and get the 32GB version for £359, which is still less than the price of a 16GB iPad Air 2. If Touch ID isn't important to you, you may prefer to pay less and get twice as much storage space.

When choosing which iPad to buy, there is also the decision of whether to get one that is capable of connecting to the mobile networks, rather than just Wi-Fi. The models that can use 3G and 4G in addition to Wi-Fi cost £100 more than the non-cellular models.





# iPad mini

## APPLE'S SMALLER IPAD

If the iPad Air is partway between an iPhone and a laptop, the iPad mini is partway between the iPhone 6 Plus and the iPad Air. It's a popular choice for those who want to read books. It also used to be popular because it was a lot lighter than Apple's full-sized iPad, but the difference in weight has since been scaled back: the iPad Air 2 weighs 437g while the iPad mini 3 weighs 331g. It's screen size that is the key difference between the iPad Air and iPad mini now, with the Air featuring a 9.7in Retina display and the mini a 7.9in display.

Apple now sells two models of iPad mini. The iPad mini 3 was launched in October 2014, and is essentially the same as the iPad mini 2, which launched in October 2013. Apple recently stopped selling the original iPad mini, which was launched in October 2012.

The main difference between the iPad mini 2 and 3 is the inclusion of Touch ID on the later model, and the option of a gold finish.

When Apple launched the newer iPad mini we were disappointed that it didn't also gain any of the features offered by the 2014 iPad Air. For that reason we generally advise saving £80 and purchasing the iPad mini 2 unless you really want Touch ID. The newer iPad costs £80 more than the previous year's model. For some, Touch ID may be worth the extra £80, but other than that there really is no other difference.

There is a much bigger difference between the iPad mini 1 and newer iPad mini models. You can still buy the 16GB original iPad mini for £199 – £70 less than what it sold for at launch (£269). This iPad lacks a Retina display, and is thicker (7.2mm compared with 7.5mm) and heavier (308g compared with 331g) than the other iPad mini models. Even if you find one for sale, we wouldn't recommend buying one.

If all you need is a low-cost device for reading books or watching video when commuting, the iPad mini 2 will be ideal.

All the iPad minis have the same rear and forward-facing cameras. The camera on the rear offers 5Mp photos while the front-facing camera – used predominantly for FaceTime



video calling – offers 1.2Mp. The only real difference between the iPad minis is that the newer models offer panorama shooting while the original iPad mini didn't. The original iPad mini lacked the 3x video zoom.

All iPad minis have a battery life that gives up to 10 hours of web surfing, video or music on Wi-Fi, and nine hours over a mobile data network.

### Speed

Another key difference between the original iPad mini and the newer iPad mini models is the fact that the earlier model features the A5 chip rather than the A7 and M7 motion co-processor combo. The A5 processor first appeared in the iPhone 4s, which should give you an idea of just how old that processor is now. It's a 32-bit system-on-a-chip that also powers the fifth-generation iPod touch and the Apple TV.

The iPad mini 2 and 3 both feature the A7 processor, which can also be found in the iPad Air 1. This is a 64-bit system-on-a-chip that first appeared in the iPhone 5s in 2013

and was the first 64-bit processor to ship in a consumer smartphone.

The A7 is around four times as fast for general processing and about eight times as fast for graphical processing. As time goes by the most demanding tasks – extremely graphically ambitious 3D games, video and photo editing, and all the more processor-intensive apps that will be released in the next few years – will begin to tax the powers of the iPad mini 1, which only offered the A5 chip.

### Price

There's an £80 gap between the iPad mini 2, and the iPad mini 3. Paying the £80 for the Touch ID isn't all that attractive, you might prefer to spend £100 more and get a Wi-Fi and cellular version. Each model is available for Wi-Fi only, or you can add cellular capabilities for another £100, which will enable you to connect to a mobile phone network when you are out and about.



# iPods

## THE MP3 PLAYER THAT STARTED IT ALL

Apple sells three types of iPod: the iPod shuffle, the iPod nano and the iPod touch.

The iPod touch is far more than just a simple music player. It comes equipped with essentially all the features of a fully fledged iPhone bar the call capabilities. The iPod nano is also a capable device, and small enough to carry anywhere, while the iPod shuffle is simple, inexpensive and tough.

Apple quietly retired the original iPod classic in October 2014, after seven years of faithful service.

With the iPod classic now a distant memory, those wanting a large amount of storage on their iPod will find the options rather limiting. Currently, the iPod shuffle offers a humble 2GB of storage, while the iPod nano boasts a rather more spacious 16GB. It's worth bearing in mind that this means the shuffle can hold around 450 songs encoded at 128kb/s, with the nano's 16GB topping out at around the 4,000 mark. The only model to go higher than 16GB is the iPod touch, which is available in 16GB, 32GB and 64GB variants. While it's nowhere near the mammoth 160GB capacity of the iPod classic, it should still offer enough room for the vast majority of users.

The shuffle is probably the most true to that original iPod, as it focuses solely on playing audio. The lack of a screen has meant that in the past you had to remember what was on the device, and switching between tracks was something of a lottery. Now, thanks to the voiceover feature, the iPod shuffle will read out the name of the track, podcast, audiobook or playlist to you, and allow you to choose the one you want to listen to.

The most obvious feature that differentiates the iPod nano and the iPod shuffle is the nano's 2.5in multitouch display. This enables the iPod nano to have a range of included apps that broaden its appeal. Music is, of course, still the primary function, with the cool ability to create genius mixes on the fly by tapping a button while a song is playing; the device will then automatically generate a playlist from your library based on that track.

A screen also means video, with the iPod nano playing any media synced to it from your iTunes account.

The iPod touch is in a different category to its smaller siblings. As the only iPod to run a full version of iOS, the iPod touch has access to the full App Store, with all the games, productivity

tools, social media and camera apps that you'd expect to find on an iPhone, as well as web access. The built-in camera, while not quite up to the iPhone quality, still offers great shots.

iPods may not share the same always-on nature of smartphones, but battery life remains an important factor for any portable electronic device. You might think that the iPod shuffle would win this category due to its lack of a power-sapping screen, but its diminutive size means a small battery and it lasts for only 15 hours. It loses out to the nano, which goes for around 30 hours, while the iPod touch – which houses the largest battery in the range – holds out for a massive 40 hours of listening time. If you watch video, though, things immediately change, with the nano affording 3.5 hours and the touch falling to eight hours.

The iPod shuffle is best for sports enthusiasts because it's cheap, hardy and can clip onto pretty well anything. Those with smaller music libraries will also appreciate the value of an inexpensive device that is still powerful thanks to the voiceover feature, as will everyone who don't want to spend a lot on a music player.

The iPod nano is ideal for those who want a svelte device with more capacity than a shuffle.

The iPod touch has a higher price tag and in many ways strays rather too close to the smartphone world to make it a compelling device for those who already own an iPhone. If you do want an internet-capable iOS device, then you can

pick up an iPod touch for less than the price of an iPad. The iPod touch is also a great option for teenagers who want to communicate with friends, watch the latest YouTube videos, listen to their music, and not have ongoing bills for their parents to pay.

### Price

If you really don't want to spend a great deal on a device, and don't mind a limited set of functions, then the iPod shuffle is a very tempting option at £40. Moving up to an iPod nano will give you a few more advanced features and eight times the storage, but the price jumps up to £129. For iPod royalty, you'll find the three models of iPod touch priced at £159 (16GB), £199 (32GB) and £249 (64GB).





# Which iPad and iPhone?

## HOW TO CHOOSE THE iOS DEVICE THAT WILL SUIT YOU

With four iPhones and four iPads to choose from, each with very different specs, it can be tricky to decide which iOS device to buy.

Those who want a 'phablet' experience – midway between a phone and a small tablet – might be interested in the iPhone 6 Plus. Fans of gaming and movies will also like the 6 Plus's big screen. Some business users may find the big screen good for productivity apps. The 6 Plus is likely to be the phone of choice for early adopters and others who like to have the latest thing, and for those on a big budget.

If the iPhone 6 Plus is a bit too big (and more than a few buyers have found this), then you might go for the smaller iPhone 6. It still has appeal for those who want a bigger screen (for games and films in particular, but also work apps and a generally more immersive experience) but a more portable device. The iPhone 6 is easier to slip into a pocket (and to use one-handed) than the iPhone 6 Plus. It's also a bit more affordable.

But what if you don't want the iPhone 6 with its 4.7in screen or the



iPhone 6 Plus with its 5.5in screen? The iPhone 5s misses out on a lot of the features in the newer iPhones, including the latest processor, various camera features including 43Mp panoramas, the ability to use Touch ID in-store (when Apple launches Apple Pay in the UK), better battery life and more. But if the smaller screen size is crucial, then it's still a good phone. And it does feature Touch ID (albeit without the NFC chip that will enable Apple Pay on your high street). It's a good deal, especially the 32GB version.

There are various features that the iPhone 5s has that the iPhone 5c doesn't, like the Touch ID fingerprint scanner and a better camera with better photography features. It's the cheapest iPhone, but it's not necessarily the best deal, crippled as it is by its 8GB drive.

The step up from iPad Air 1 to iPad Air 2 brings a faster processor, a better rear-facing camera (8Mp, up from 5Mp) and Touch ID, as well as a device that is 6 percent lighter and 19 percent thinner, with a less reflective screen and the prospect of iOS update support for about a year more than the iPad Air 1. Is all that worth an extra £80? Probably.

The iPad Air 1 is still a great iPad, though, fast enough for all current apps. Those who have light use in mind (email, browsing the web, simple games) should be fine with it, and would save the extra £80. However, such customers might want to consider a cheaper option still: the iPad mini.

The first and most obvious thing to say is this: £80 extra for the iPad

mini 3 (compared with the equivalent mini 2) is a tough sell. All you get for that is Touch ID, and while Touch ID is cool and convenient, it's hardly worth £80.

The two iPads are identical in every other way except for colour options – for example, the iPad mini 2 and 3 offer the same A7 chip. This means that there's no real reason to upgrade.

There may also be a newer iPad on the way. Rumours suggest an iPad Pro is in the pipeline.





# Apple TV

## APPLE'S SET-TOP BOX

The Apple TV is a connected set-top box, measuring 23mm by 98mm by 98mm and weighing 27g, that offers access to iTunes TV shows and movies, as well as content from Netflix, YouTube and Vimeo. You can also stream content to your TV from your Mac, iPhone and iPad. It costs £59.

The Apple TV isn't a TV in the normal sense of the word, because it doesn't have free-to-air channels or a digital video recorder to store shows to watch at a more convenient time. However, it does offer what could be described as channels, and this content keeps on growing, leaving us hopeful for a future where the Apple TV will include links to on-demand services just like our iPhones and iPads do – think the iPlayer and 4oD apps and you're not too far away.

Apple has made multiple updates to the Apple TV software over the years, adding a number of new app-style TV channels, delivering new content to Apple TV users. Most recently the Now TV app addition brought Sky entertainment, movies and sports content to the Apple TV, for a subscription.

Probably the most popular app on the Apple TV is Netflix. In many ways it's the only reason we recommend the Apple TV right now, because without it there would be very little content available to UK users. When a Netflix subscription costs just £5.99 a month, it is very difficult to recommend spending almost that much on hiring a single movie to watch via Apple's own iTunes Store, although you will find some iTunes content that won't appear on Netflix for months or years – or maybe not at all.



In the US the Apple TV includes Hulu Plus, HBO Go, Showtime Anytime, Fox Now, Watch ABC, Disney Channel, Disney XD, Disney Junior, PBS, A&E, History, Lifetime, WatchESPN and much more.

It is possible to run apps for some services on an iPhone, iPod Touch or iPad and then stream them to the Apple TV using AirPlay – but the Apple TV really needs to provide direct access to those services without requiring any expensive additional hardware.

Despite the limited content here in the UK there is still a lot to like about the Apple TV. It's well built and easy to use. Some of the better features work only with other Apple products, but if you own those products then the Apple TV is a great addition.

We like the Apple TV's user interface too. It's simple and intuitive, as you'd expect from Apple, and will be familiar to all iPad and iPhone users as it utilises the bright and bold iOS looks. You navigate the setup menus and input Wi-Fi network and password via the included Apple TV remote or using your iPhone and the Remote app. You can also pair it with a Bluetooth keyboard. Using the keyboard

of the iPhone app simplifies the task of entering network passwords or using the search function when browsing content.

The Apple TV includes an HDMI interface with 1080p output for connecting to your high-def TV, as well as built-in Wi-Fi for your home network. There's no hard drive inside that tiny little box, so you can't download films or TV programmes for permanent storage, but you can download purchases onto a Mac or PC using iTunes and then stream them to the Apple TV using Apple's AirPlay wireless technology. AirPlay will also allow you to stream video from any iOS mobile device.

### New Apple TV on its way

The last time Apple updated the Apple TV was back in January 2013, and even then it was just a minor update. Speculation about a fourth-generation Apple TV has been mounting, and it's certainly possible that Apple is gearing up to launch a new Apple TV this year.

In the two years since the last Apple TV update, many competing products from rival companies have launched, so Apple really needs to get a move on if it wants to dominate the set-top box market.

This new Apple TV may be smaller than the existing one, and it may feature a new remote, be Siri-activated, or even, rumour has it, be controlled using Kinect-like gestures.

Other rumours suggest that the new TV could include access to the iOS App Store so that users can purchase apps that can be viewed on their TV set – as well as games that can be played on the Apple TV. Our biggest wish, though, is that Apple brings the UK on-demand channels to the Apple TV – all its competitors offer them and their absence represents a serious failing on Apple's part.

Hopefully, any new features coming to the Apple TV will work on the current model as well as any new one that Apple launches.



# Apple Watch

## APPLE REINVENTS THE SMARTWATCH



Apple unveiled the Apple Watch back in September 2014, and finally went on sale on 24 April 2015.

The best news here is that Apple's not just launching a smartwatch but a whole raft of smartwatches. By combining the three different Apple Watch categories, the two different face sizes, and the accompaniment of straps, there is the potential for 38 different Apple Watches, so there will be a style to suit anybody. And crucially, since Apple is offering two watch face sizes, the Apple Watch will be as comfortable on a female wrist as it is a man's.

Where other companies have failed to come up with a smartwatch design that suits anyone, Apple has solved the issue by coming up with multiple designs to suit everybody.

Rather than try and make one watch to suit everyone, Apple has designed three basic Apple Watch varieties targeted at different groups of people. Starting at £299, the Watch Sport, for example, is ruggedised and has a strengthened Ion-X glass face so it should be able to take some bashing. It's also the lightest of the three Apple Watch editions because its case is made from anodised aluminium. The Watch Edition is clearly designed for the fashion-conscious, with a beautiful 18-carat gold case available in yellow or rose gold; it even comes in a fancy leather box that doubles as a charging cradle. Prices start at a staggering £8,000.

The watch face itself comes in two sizes: one is 42mm high, the other 38mm. The sapphire (for the Apple Watch and Watch Edition) or Ion-X glass face (for the Apple Watch Sport) sits in a case made from stainless steel, aluminium or gold, depending on which of the three models

you opt for (Apple Watch, Apple Watch Sport or Apple Watch Edition, respectively). The stainless steel finish is available in standard or black, the aluminium finish in silver or grey, and the 18-carat in yellow gold or rose gold.

There is also a collection of straps to choose from, including link bracelet, sport band, leather loop, classic buckle, modern buckle and Milanese loop. The leather loop and sport band options are offered in multiple colour choices. The sport band comes in black, white, pink, blue and lime green, for example.

And if that's not enough customisation options for you, there are a number of watch faces to choose from – some are even animated. And you can change the colours and design elements of these.

The problem that many of the current smartwatches have is that the user interface is packed into a tiny display and you need to manipulate those tiny visual elements using your fingers – which are inevitably bigger than the elements you are trying to touch.

Apple's solution is to make use of the stud on the side of the watch that was once used to wind up clockwork watches. This stud – its proper name is the crown – has been turned into what Apple calls a Digital Crown. This Digital Crown solves the problem of swiping through icons on a minuscule display. You can use the crown to zoom in on interface elements and scroll through content on the watch face, without your fingers obscuring the view. The Digital Crown can be used to navigate through lists as well as zoom in on data, maps and photos.

This doesn't mean that the watch face isn't touch-sensitive. You can tap and swipe the

Apple Watch face. In fact, the Apple Watch can determine just how hard you touched the screen. It can distinguish between a normal tap, used to select things, and a harder press, used to access contextual menus. Apple calls this technology Force Touch.

You aren't the only one doing the tapping when it comes to the Apple Watch. The watch incorporates what Apple calls a taptic engine, which lets it 'tap' your wrist to alert you to notifications. It's similar to the vibrate function on an iPhone, except that only you know that you are being nudged.

You can also interact with the Apple Watch via Siri, dictating messages or requesting turn-by-turn directions.

There will be various apps available for the Apple Watch. These are slimmed-down snippets of apps, referred to by Apple as 'Glances'. You will be able to glance at Messages, Mail, Weather, Calendar, Maps, Passbook, Music, Photos and more. Apple will also offer its own Activity app for the Apple Watch – it uses three circles to demonstrate how close you are to meeting your targets for calories burned – and a number of other health and fitness apps will also be available.

You will be able to use the Apple Watch to pay for things, just as soon as Apple launches its Apple Pay technology in the UK. All you do is double-click the button and hold up your watch to a payment reader. This is made possible because the Apple Watch includes an NFC chip, as do the iPhones 6 and 6 Plus. For added security, if you take the Apple Watch off, it'll lock and require a code before you can purchase anything.

# Apple peripherals



## AirPort Time Capsule

2TB £249, 3TB £349

The Time Capsule works with Apple's Time Machine app to make backing up your Mac really simple. It comes with 2TB or 3TB of storage and continuously makes a copy of everything on your Mac, backing up the files you've changed automatically, wirelessly, and in the background.

Full review: [tinyurl.com/Lh6pjqu](http://tinyurl.com/Lh6pjqu)



## AirPort Express

£79

Apple's AirPort Express is a Wi-Fi base station that also features the ability to stream audio from a Mac, iPad or iPhone to a stereo using AirPlay – kind of like an Apple TV for your stereo. It also works as a wireless access point to extend the range of a network but is only 802.11n-capable.

Full review: [tinyurl.com/q4xqsqz](http://tinyurl.com/q4xqsqz)



## AirPort Extreme

£169

The AirPort Extreme is a Wi-Fi base station that combines the functionality of a router, network switch and wireless access point. You can also attach a hard drive to it for wireless network attached storage (NAS). It supports 802.11ac. Note that AirPort devices are routers, not modems.

Full review: [tinyurl.com/mfdLLsc](http://tinyurl.com/mfdLLsc)



## Thunderbolt Display

£899

Introduced in 2011, Apple's Thunderbolt Display is almost four years old. It offers 2560x1440 resolution, 375cd/m<sup>2</sup> brightness, and a 1,000:1 contrast ratio. But it's more than a monitor – it offers three USB 2.0 ports, a FireWire 800 port, gigabit ethernet and, of course, a Thunderbolt port.

Full review: [tinyurl.com/nkhkzm8](http://tinyurl.com/nkhkzm8)



## Magic Trackpad

£59

Apple introduced the Magic Trackpad back in 2010. It's similar to the trackpad on a MacBook, and it's designed to complement Apple's Wireless Keyboard as an alternative to a mouse. The Magic Trackpad's functions are practically identical to its laptop counterparts.

Full review: [tinyurl.com/qd474vb](http://tinyurl.com/qd474vb)



## Magic Mouse

£59

Sounding a bit like a kid's superhero, the Magic Mouse is a multi-touch Bluetooth mouse that lets you click anywhere, scroll in any direction and perform gestures like you do on the Trackpad. It's a bit more precise to use than the Magic Trackpad and is included with every new iMac.

Full review: [tinyurl.com/nc9o95e](http://tinyurl.com/nc9o95e)



## Apple Wireless Keyboard

£59

Like the Magic Mouse, the Bluetooth-enabled Apple Wireless Keyboard is available with every new iMac. Its use doesn't stop with the Mac, though. Apple's Wireless Keyboard can be paired with an iPad, iPhone or an Apple TV to make entering data easier on those devices.

Full review: [tinyurl.com/kuoa86k](http://tinyurl.com/kuoa86k)



## Apple Keyboard

£40

There is also a wired keyboard available for those who prefer not to be constantly looking for batteries. It features a numeric keyboard, which is handy if you are often working with data. We love the Apple keyboards because they are quiet to use and the low profile helps avoid RSI.

Full review: [tinyurl.com/px5rj8c](http://tinyurl.com/px5rj8c)



## Apple EarPods

£25

Designed according to the geometry of the ear, Apple's EarPods are more comfortable for many people than other earbud-style headphones. A built-in remote lets you adjust the volume, control the playback of music and video, and answer or end calls with a pinch of the cord.

Full review: [tinyurl.com/mmvo52c](http://tinyurl.com/mmvo52c)



## Apple In-Ear Headphones

£65

Apple says its In-Ear Headphones with a mic and remote are "engineered for superior acoustic accuracy, balance and clarity". Each earpiece contains two dedicated drivers – a woofer to handle bass and mid-range, and a tweeter for high-frequency audio. If you prefer in-ear headphones – which tend to let less sound leak, so you don't have to blast the sound out as high – these could be a good option.



# Apple software



## OS X 10.10 Yosemite

Free

The latest version of Apple's operating system for the Mac launched in October 2014 with a completely new look. Benefits of the new OS include better continuity between your iPad, iPhone and Mac, with features such as AirDrop and Handoff making it easier to move between devices.

Full review: [tinyurl.com/ohv23hs](http://tinyurl.com/ohv23hs)



## iOS 8

Free

Apple introduced iOS 8 in September 2014. The new operating system for iPad and iPhone brought a way to share content with your family and iCloud Drive, making it easier to store and access data in the cloud. Other additions include extensions, improved keyboard and the Health app.

Full review: [tinyurl.com/kmavwnw](http://tinyurl.com/kmavwnw)



## Final Cut Pro X

£229.99

Final Cut Pro X is Apple's professional video editing suite. You can work with multiple streams of 4K ProRes at full resolution, play back complex graphics and effects in real time without rendering, output 4K video to ultra-high-definition displays, and create 3D titles.

Full review: [tinyurl.com/phs7zc7](http://tinyurl.com/phs7zc7)



## Logic Pro X

£149.99

Apple's Logic Pro X is Apple's professional music creation software. It includes a huge collection of instruments, effects and loops, as well as drummer tracks. It's aimed at professionals but is also a great step up from GarageBand for those who want to get serious about music creation.

Full review: [tinyurl.com/nfgavnz](http://tinyurl.com/nfgavnz)



## GarageBand

Mac £3.99, iOS £3.99

This music creation software is available for both Mac and iOS. It offers a complete sound library with software instruments and virtual session drummers. You can learn to play an instrument as well as play, record, create and share your hits. Free with new Macs and iOS devices.

Full review: [tinyurl.com/nk5srLq](http://tinyurl.com/nk5srLq)



## iMovie

Mac £10.99, iOS £3.99

This home movie making software is available for iPhone, iPad and Mac. You can create an HD movie, or quickly put together a Hollywood-style trailer. It's an easy way of turning the video you take on your iPhone into something you'd want to share. Free with new Macs and iOS devices.

Full review: [tinyurl.com/pc7xp3e](http://tinyurl.com/pc7xp3e)



## iTunes 12

Free

Apple's iTunes was originally music jukebox software that came into its own with the launch of the iPod. Since then iTunes has grown and is now the means by which users can manage all their media: music, movies, apps and more. Use iTunes on a Mac to access the iTunes Music Store.

Full review: [tinyurl.com/kj32hvu](http://tinyurl.com/kj32hvu)



## Pages

Mac £14.99, iOS £7.99

Pages is Apple's answer to Microsoft Word (and is compatible with Word). It's a word processor for Mac and iOS that works seamlessly between the different devices. In many ways it's more of a page layout application for creative people, with more design-led features than Word.

Full review: [tinyurl.com/qfdzjfc](http://tinyurl.com/qfdzjfc)



## Keynote

Mac £14.99, iOS £7.99

Keynote is a presentation app for Mac and iOS that is basically Apple's answer to PowerPoint. It features really easy-to-use tools, some great effects, animations and transitions for creating attractive presentations. You can save Keynote documents as PowerPoint files if you wish.

Full review: [tinyurl.com/nz3q3uf](http://tinyurl.com/nz3q3uf)



## Numbers

Mac £14.99, iOS £7.99

Apple's answer to Excel is Numbers, a spreadsheet app that can be used on both Mac and iOS devices. Because it's Apple, Numbers lets you turn your data into a thing of beauty, dropping your figures onto one of Apple's templates, but it also does the maths, supporting over 250 functions.

Full review: [tinyurl.com/o5qnk4g](http://tinyurl.com/o5qnk4g)

# Spend, spend, spend

We are being sold the ability to spend money we don't have. And we love it

Following Apple's recent and rather underwhelming WWDC keynote, the aspect that most excited one of my Macworld colleagues was the imminent introduction of Apple Pay to the UK. I suspect he isn't alone – not least because I too felt the frisson of excitement at the idea of being able to wave a phone at a barista in order to purchase an over priced coffee. That Apple has massively trumped Google with its race to contactless payment feels like a big win. But why?

It is undeniably convenient to be able to pay in a contactless way. And the tech is futuristic and sexy. But it is kind of weird that the ability to spend money quickly now constitutes an exciting feature. Not least because the ability to spend money we don't have is what got us in all that nasty trouble in 2008.

I'm not complaining. When I was a student and the bank handed me a credit card in lieu of an overdraft, I was only too happy to spend its money on CDs from Our Price (different times, reader, different times). It took me a decade to pay off all the debt I accrued from such fripperies,



but I didn't have to take the rope when the bank offered it. Indeed, I happily threw my head in the noose.

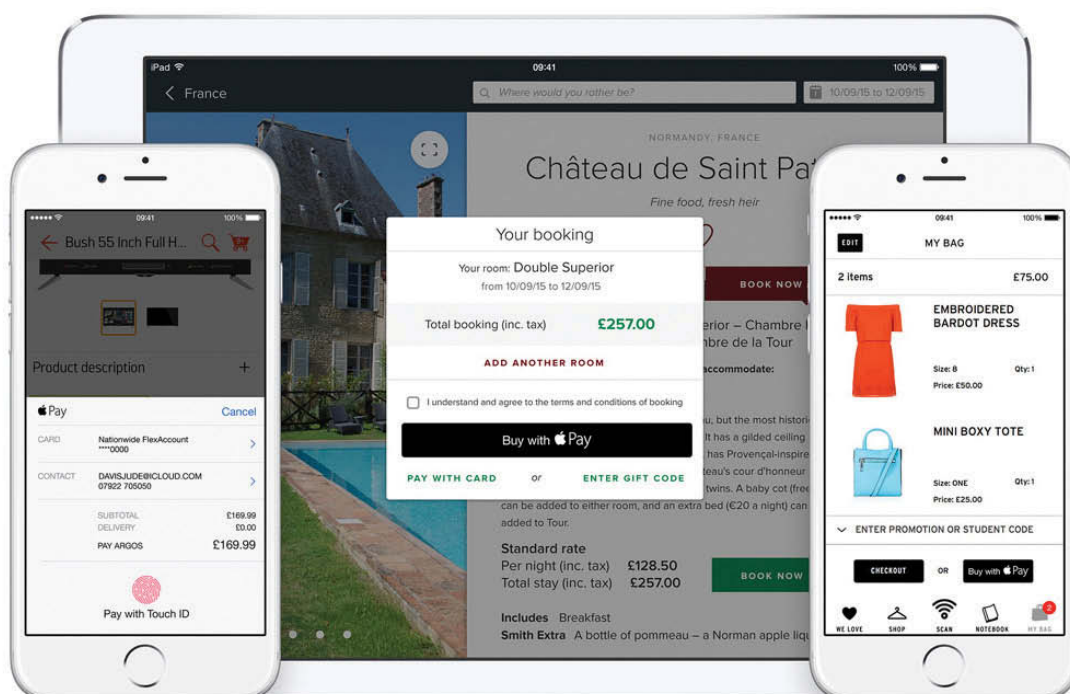
Of course, we now know that buying things on credit is a bad thing, by and large. Especially when entire nations are buying things they can't afford, from other nations, who are making a mint from manufacturing (and then lending them the money back to buy more stuff). On a very broad level, the credit crunch was caused

by the West borrowing money from the East in order to pay for products manufactured in the East.

The trouble is that tech companies are now offering us the ability to borrow more money, more quickly, to pay for more stuff. (If you are spending your overdraft in Starbucks, you are borrowing money for stuff, trust me.) What's more, the hardware on which we are making those purchases is – yes – manufactured in the Far East. Yes, in the countries from whom we are borrowing the money, in the end.

I'm not being a killjoy. Or, at least, I am not only being a killjoy. I like a pointless purchase as much as the next man. And I am certainly not blaming Apple or any tech company for giving the customer what we want.

But it does concern me that in this time of peak smartphone, we are being sold new devices on the basis that they enable us to buy more stuff, more quickly. It's a more efficient way of getting ourselves into further credit crunchery, and we are welcoming it – nay demanding it – with one voice.



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